The Motion Picture CAMERA Magazine

AMERICAN Cinema

TECHNICAL

this issue

Portable Background Projector

New Carbon Arc Development

Photography of the Month

. . . and other features

for the amateur

16mm. Fine Grain Negative Development

Making Pictures Under Water

"Here's How" Answers Many Questions

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Vol. XIV **August, 1933** **Number 4**

What to Read

Next Month

•EMERY HUSE will continue with his series on Sensitometric Control—Next month we will have Hartley Harrison with us again. He will discuss filters, their uses and effects in the third of his series of articles on this subject—A.S.C. members will contribute timely and informative articles on the tools of their craft . . . give you the information of how they apply the various things at their command for the improvement and betterment of photography—Next issue promises unusual interest.

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The Staff

Down to the sea in
LAMP BULBS!

● In their unceasing quest for lamp improvements, General Electric's scientists tracked down the cause of that light-reducing, black deposit on the inside of lamp bulbs. The tungsten filament, like heated water, was evaporating and then condensing on the glass. But how to check it?

The evaporation of water can be checked by gas pressure: Anyone who has ever driven a car in the mountains knows that water boils more readily there than at sea level where the pressure of the atmospheric gases is greater. Yet experiments tended to show that heated metals in the presence of gas, united with the gas and disintegrated. Undeterred, General Electric's fact-hunters filled some lamps with *chemically inert gas.*

The first test showed no improvement. They tried it again . . . and again . . . and they found that the rate of filament evaporation *did* decrease! Through gas pressure, they could make lamp filaments "come down to the sea from the mountains."

But the vital importance of this discovery for you springs not from its use to lessen bulb blackening; other means were found to do that. General Electric seized on the more practical application which gas pressure offered: the ability to burn the filament at a higher temperature, without changing the rate of evaporation, or in other words, its life. This gives you a light that is much brighter, *and photographically more effective!*

Such research is typical of General Electric's constant efforts to provide you with the best lamps that money and brains can produce. General Electric Company, Nela Park, Cleveland, Ohio.

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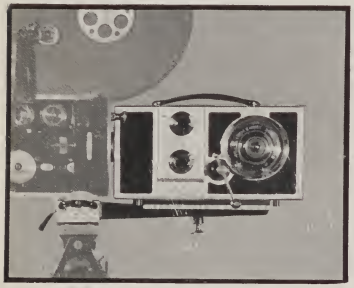
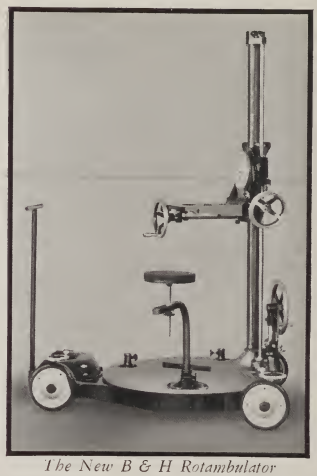


B & H Cooke Varo Lens

B & H Cooke Varo Lens

The B & H Cooke Varo Lens, originated to overcome limitations of dolly shots in awkward situations, has led to picture results far beyond those originally contemplated. This ingenuity in the use of new products on the part of cameramen is matched only by the ingenuity of the Varo Lens itself. The lens varies focal length while automatically retaining critical focus and correct exposure. Current results: "Strangers Return" and "Night Flights." Available on rental to responsible studios.



The New B & H Rotambulator

Write for complete data and prices. Available on rental to responsible studios.

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Filmo 70 utility equipment, specially designed on specifications of individual movie-makers, now available to all owners . . . gives new professional versatility to Filmo.

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External 200-foot magazine . . . Electric motor, either 12- or 110-volt, for interrupted operation. Permits remote control . . . Hand crank, 8 to 1 ratio. Permits moving film backward . . . Precision range finder, built into the variable viewfinder on the 70-D Camera door.

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The new Filmo JS Projector hits the peak of screen brilliance with a powerful 750-watt lamp. The increase in illumination over 500-watt systems is approximately fifty per cent. Automatic rewinding, fully gear-driven mechanism, fast F 1.65 lens, aero dual cooling.

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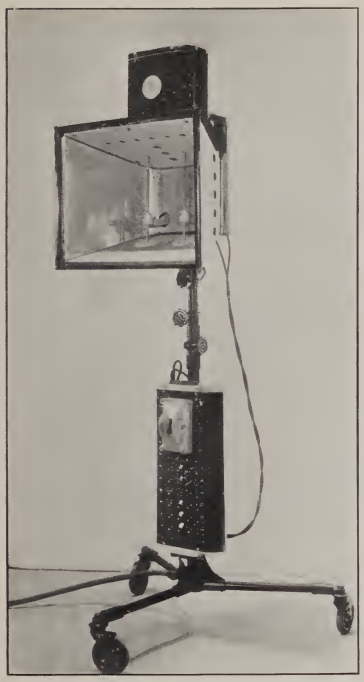


New Development In Carbon Arc Lighting

by
Elmer C. Richardson
of Mole-Richardson, Inc.

PROGRESS in the development of carbon arc lighting equipment for use in motion picture production was retarded by the introduction of panchromatic film, the sensitivity of which was so well adapted for photographing with filament light source.

The photographic requirements of a new color process, developed by one of the leading firms in this field of photography, seem to be best met with carbon arc lamps. The Sun Arcs and 80 ampere Rotary Spots used by many studios in combination with incandescent lighting have been suitably silenced so that they can be operated in conjunction with sound recording apparatus. However, for the new color process there being no satisfactory general lighting unit, the firm of Mole-Richardson, Inc., was requested to develop a broadside lamp which would meet the following specifications:

1. The lamp to produce an illumination level of 200-foot candlepower as measured at fifteen feet with a standard Weston photometer.
2. The lamp being required for general illumination purposes must have a comparatively flat distribution curve over a projection angle of sixty degrees or more, and the field of illumination to be devoid of any hot spots, i.e., areas of illumination which are photographically objectionable
3. The feeding mechanism of the lamp to be so designed as to give a reasonably uniform level of light intensity during its period of operation, and the spectrum of the light emitted is not to show any alteration of its characteristics during the period of operation.
4. The lamp to be silent in operation so that it may be satisfactorily operated in conjunction with modern sound recording apparatus.
5. The lamp to take a form, and be so mounted that it will be convenient for placement, and to be of such weight as to be easily handled on the set.
6. The lamp to be economical in operation both as respects attendance and the consumption of currents and carbon electrodes.

The requirements set forth in this specification demand a type of equipment far superior to any type of broadside lamp heretofore supplied to the industry.

Mole-Richardson, in the design of their new 40 ampere Type No. 29 Twin Arc Broadside lamp, have not only met the specifications, but in a number of instances exceeded them.

The lamp, which is illustrated in the accompanying photograph, has been designed for operation at all times with cover glasses to eliminate the possibility of injury to the eyes of the actors. The diffusion glass which is supplied with the equipment has a high lead content which impedes the transmission of ultra-violet light, which is the component of arc radiation which causes the inflammation of the eyeball popularly known as "Klieg eye." When equipped with cover glasses these lamps produce more than twice the illumination afforded by the old types of side arcs of similar current capacity when operated open, and produce a very smooth field of illumination. The area of the aperture of the lamp has been made larger than was that of the old type equipment, so that though the lamps are of higher intensity the illumination is so distributed as to be comfortable to the actors in the set.

It was characteristic of the old broadside equipment that at the time it was initially switched on, its intensity was at the maximum, and after operating for three rr four minutes the level of intensity would drop thirty or forty per cent. In operating the color process for which this equipment has been developed it is most desirable, that at all times during the photographing, the level and quality of illumination be uniform; to comply with this requirement a rather unique principle of arc control has been devised for this new lamp.

The old type of broadside struck the arc and maintained the position of the carbon electrode by means of a single

(Continued on Page 151)

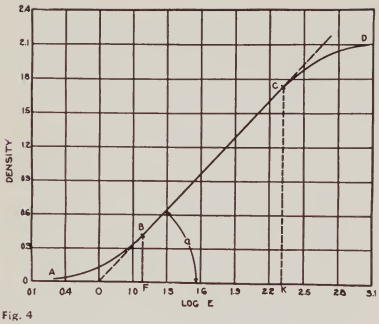


Fig. 4

Sensitometric

Editor's Note: This is the second in a series of articles by Emery Huse, A.S.C., on Sensitometric Control. In the September issue Mr. Huse will discuss actual motion picture laboratory negative and sensitometric control.

ONE very important item which should be well understood in the practical application of sensitometry to the control of the development of motion picture negative film is the fact that a sensitometric strip which has been made under precisely controlled conditions of time and intensity can only give data as to the degree of development obtained. Thus, such a sensitometric strip developed with an exposed picture negative will show a definite gamma value for the strip, but will not give any precise information as to the contrast of the picture negative developed along with it. Contrast in the negative is not only a function of gamma but also of the lighting balance in the set at the time of exposure. If at all times the brightness balance would be maintained constant in the various scenes to be photographed, then the sensitometric strip would give a true indication of the contrast of those scenes after development. However, this is not possible. Each and every scene of different subjects has an inherent brightness contrast characteristic of its own and upon controlled development the resultant densities in each scene indicate the contrasts which were in those scenes. The point which is being stressed is the fact that because picture negatives are developed in a solution which gives a definite value of gamma from the sensitometric control strip, it does not follow that these negatives have the same degree of contrast as shown by the gamma value of that strip. They bear a very definite relationship to each other and under certain conditions can be used synonymously, but this condition does not always hold. If we refer to Figure 4 it will be readily observed that the straight line portion of the H and D curve from which gamma is determined exists only between points B and C. This straight line portion contains only part of the various densities which go to make up the complete curve. This being the case, the densities which are beyond either extreme of the straight line must play some part in the photographic rendering of subject or scene. When one looks at a motion picture on the screen and studies it for contrast, all thoughts of gamma disappear. What the observer is looking at is the relationship existing between the highlights and shadows. Sensitometrically this refers to the toe and shoulder portions of the H and D curve. Therefore, it seems evident that in studying contrast sensitometrically that densities which lie on the toe and shoulder must be considered. In evaluating contrast it is necessary to determine the density at some fixed point on the toe and shoulder and contrast can then be expressed in terms of a density value. The difference between the density chosen on the toe and that on the shoulder gives this data. It has been sensitometric practice to consider the extremes of the curve as the density at those points on the toe and shoulder where the slope is equal to .20. From the curve as shown in Figure 4 a .20 gradient on the toe and shoulder would be slightly above point A and slightly below point D. The word "gradient" signifies the slope of the curve at any given point. However, along the straight line of the curve the gradient is constant and is equal to gamma.

As was previously indicated, there is one instance in practical sensitometry where gamma and contrast can be used synonymously and that is in the sensitometric control of sound track. Inasmuch as the exposures on the track are based upon the straight line portion of the H and D curve, and for most recordings densities in the actual track fall within the limits of the straight line, then in this instance where the maximum and minimum densities recorded are completely included in the straight line, it is quite simple to see that contrast and gamma are identical.

Every major studio or commercial laboratory in Hollywood is adequately equipped with or has access to the instruments which have been described in the early part of this paper. Furthermore, each laboratory has a man, or several men, taking care of the sensitometric routine. It can be stated rather strongly that with the advent of sensitometric control motion picture film processing has attained a degree of perfection which has not been hitherto possible. Of course all of the current quality should not be laid to sensitometric control because during the past several years much has been accomplished from the standpoint of improved machine development, photographic emulsions, developers, and processes which have aided in this improvement. However, it is the candid opinion of the author that sensitometric control has revealed deficiencies in the processing systems which have not heretofore been observed, or if observed, were not properly taken care of because there was no technical control available to indicate the direction in which improvement should be made.

In attempting to convey clearly a concise picture of the actual control methods in use it is felt that the subjects of control for negative, positive and sound track should be treated individually. Furthermore, that this paper might contain more than the opinion of the author, data will be presented from actual production laboratories, which data will show clearly the degree of consideration which is given to sensitometric control.

Before discussing actual laboratory data there is an important consideration which should be given to the development of negative film. In Hollywood there are two distinctly different methods by which negative film is developed. One method is that of a constant time of development. The other method is that which is colloquially termed the test method. By the constant time method is meant that the developing solution is maintained at a definite control gamma, as shown sensitometrically, and

Control in the Processing of Motion Picture Film

by

*Emery Huse, A.S.C.

that exposed negatives of all types, except very special effect shots, are developed under this standard predetermined condition. By the test method it is necessary that the cameraman photograph an extra portion of each scene to be used as a test for development. These tests are developed for a constant time, which time has been predetermined as normal for correct exposures. After the development of these tests the responsible party in the laboratory examines them and determines the time of development which in his opinion would be best suited for each take. When one considers a large production company with several individual companies in production, the number of tests which go through by this system is appreciable. Over a period of time it is found that many of these scenes receive normal development. The remaining scenes may vary from plus or minus one-half to several minutes from the normal. In many instances where scenes were shot under adverse conditions their photographic quality is materially improved by this method of negative development. The time consumed is greater and the work slightly more involved, but in view of the results obtained the quality is very favorable.

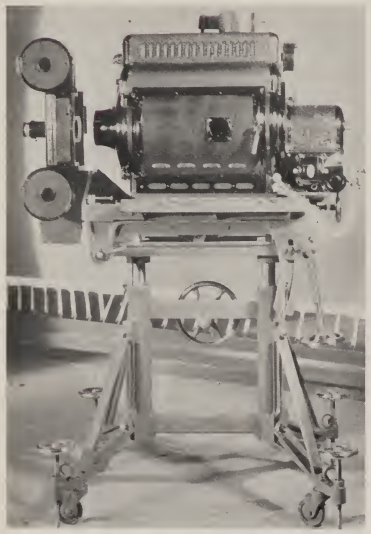
The author after having observed over a five-year period the results of the development of negatives by either of these two systems is convinced that both have their merits and can be and are productive of excellent results. From the standpoint of pure sensitometric control, the developing solution itself is studied before any production work goes through it. One of the first things done when a new developer is put into the system is to run a sensitometric control, which consists of the development of a group of sensitometric strips all made under a set condition. It is determined from the results of these developed strips just what time of development is necessary to give the desired control gamma. Once this is established, then regardless of which of the two systems of negative development is to be employed that time becomes the standard for that machine operating at a definite speed under a definite condition of developing solution and temperature. If the laboratory is operating purely on the time basis then all of the negative to be developed goes through that solution for the time which the tests indicate produces the desired control gamma. The sensitometric control which is applied to this system consists of periodic tests, such as at half hour intervals, which give data showing whether or not the degree of development was greater or less than that determined by the original test. With knowledge as a result of practice which now exists in the laboratories it is a simple procedure to determine the rate at which a replenisher must be added to the developing solution to maintain it at its predetermined controlled developing power. Naturally, during the course of development by either system the developing strength of the solution changes as increased footage goes through it. It is necessary to find a means of maintaining the fixed development condition, whether it be by altering the time of development or the chemical replenishment.

In some laboratories samples of a test negative are developed along with their sensitometric strips.

This test negative is usually a closeup of a girl. Many laboratory men still feel that they can see more in the picture than they can be told about that picture from the data which is indicated by the sensitometric analysis. By developing both sensitometric and practical tests a double check is made. It is remarkable to observe the fine details of density and contrast which can be seen by the experienced laboratory man in the examination of the test picture negative. All laboratory men are becoming more thoroughly educated in the art of sensitometry and are becoming quite able in determining from the sensitometric data the cause of any differences which might occur and show themselves between two successive tests. There is still in existence in Hollywood one or two smaller laboratories operating by the rack and tank method. Their system of sensitometric control is quite similar to that applied to machine development. With very carefully laid down manipulative procedures good results can be and are being obtained. One laboratory in particular uses the rack and tank method for the development of all film, including picture negative and positive and sound track. However, inasmuch as we are more particularly interested in the modern methods of control, we shall not deal further with any system except one which makes use of developing machines.

All of the foregoing under the general heading of negative development has dealt with the procedure involved. Nothing has been said quantitatively about the results obtained. During the past five years there have been some rather definite changes in what is desired from the standpoint of negative quality. In 1928 the author had occasion to measure sensitometrically the control gammas of the solutions used by the various major laboratories in Hollywood. This was before any sensitometric methods were in use in these laboratories. The film which was used was panchromatic negative which was then in style. The sensitometric exposures were made on a time scale sensitometer in the West Coast Laboratories of the Motion Picture Film Division of the Eastman Kodak Company. This instrument was a duplicate of the time scale sensitometer in use in the Research Laboratories in Rochester. The gamma values resulting from exposures made on this instrument were of the same general order as those obtained currently with the Type IIb sensitometer. At the time of these tests the average negative picture gamma was very close to .80, some laboratories running higher values. A few years ago, particularly after the introduction of the high speed super-sensitive type of film, it was found that the trend in general negative quality was toward a lower degree of contrast, which exhibited itself from the sensitometric data made at the time. Measurements of negative gamma from .55 to .65 were quite normal. At the present time, 1933, the average negative gamma has increased somewhat and measurements show negative gammas falling between .60 and .75, with the average being very close to .67. It is not within the scope of this paper to explain why this trend has taken place, if it were possible, although it can be stated in brief that as the details of the photographic method of recording sound were improved, changes were necessitated in the entire processing system of both sound and picture films.

*Paper delivered by Mr. Huse at April, 1933 S.M.P.E. Convention.



The new Teague mobile process projector.

A Super-Portable Background-Projector

by

Frank B. Good, A.S.C.

WITHIN the past two or three years, the "transparency" or projected-background process has revolutionized the art of trick cinematography. and effected tremendous savings in production-cists. Its basic principles are too well known to merit repetition beyond the simple statement that the process consists of the projection of any desired cinematographic background upon a translucent screen behind the actors, with background-projector and camera operating in an electrical interlock. This process has literally made possible the making of several of the most successful productions of the day, and has saved hundreds of thousands of dollars—and incalculable time and effort—in its application to other productions. It is probable that nine productions out of ten contain at least one transparency sequence— and in a majority of instances, more than one sequence.

Heretofore, however, this process has suffered from the fact that most transparency instalations have been of the fixed type, and accordingly, confined to a single stage. In natural consequence, the scheduling of process sequences in a large studio has become increasingly difficult. To reduce this congestion, process technicians throughout the industry have been experimenting with the development of portable transparency installations, with varying degrees of success. The latest—and probably the most successful—of these is one recently developed by George J. Teague, one of the pioneers in transparency work.

In designing this equipment, Mr. Teague (who will be remembered as one of the designers of the equipment first used for projected-background work, and associated with the process department of the Fox Studio on all process work from the first examples in "Liliom" and "Just Imagine" down to such recent productions as "State Fair") has had in mind the ideal of creating a background-projector as portable as a modern blimped camera. In attaining this end, however, he has taken pains to attain equal flexibility combined with the greatest rigidity and precision.

As can be seen from the illustration, the projector is mounted on a wheeled base, fitted with pointed jacks by which it can be rigidly anchored to the stage-floor. Above this comes a geared hoist, by which he projecion-head can be raised or lowered in a vertical plane, and locked rigidly at any point. Above this is a firm base fitted with adjustments by which the projection-head may be tilted or revolved to any desired position; the tilt giving a range of 20° each way from tne horizontal, and the revolving head allowing a full 360° swing. Both of these movements, of course, are also fitted with positive locks, so that the projector, though easily adjusted, is held rigidly in place when in use. The lamp-house is mounted on a rigidly-cast gib, which can be slid forward and back in absolute optical alignment and with the projection lens, or instantly removed. This movement, too, is fitted with postive locks.

The projection-head itself is extremely compact, yet rigid. Registration is secured by the Technicolor method. The shutter—balanced with extreme precision, and allowing the maximum opening—it is behind the film aperture. The projector is powered by an interlock motor, placed on the right-hand side, and fitted with a simple connection allowing an exceptional degree of adjustment for synchronization with the taking camera. The whole mechanism is rigidly fitted into a finely machined base-plate, and demountable by releasing a single bolt and disconnection of the motor-shaft slip-joint. By this means, if it is desired to fly the equipment, the head and lamphouse can be removed from the base in a matter of seconds, and reassembled in an equally brief interval.

The lamp-house is a standard, high-intensity projection mirror-arc type; this is an integral part of Mr. Teague's design. Only, he says, by absolute co-ordination of all of the optical units of the projector can the maximum efficiency be attained. In a majority of installations, he points out, the lamp-house is considered solely as a light-source, not as an intergral part of the optical system. Accordingly, though transparency-technicians frequently change the focal-length of the projection-lenses used, according to the requirements of the scene to be made—but use the same reflecting-system at the light-source throughout. This practice, he has found, is in a large measure the cause of the "hot-spot" which so frequently causes trouble in this work. Accordingly, he has gone to great pains to co-ordinate the foci of the mirrors used with the foci of the projection-lenses employed; he has, moreover, found it imperative to use mirrors and lenses of the same manufacture. By this

(Continued on Page 148)

Ribbon Microphones Work Best In Tropics

Len Roos, garbed in dinner clothes at 7 o'clock in the morning to photograph the Sultan in his palace. This Leica shot was taken in the interior of the palace.

by
Len Roos, A.S.C.
As told to Karl Hale

WHEN Universal assigned me to their animal picture to be made in Java, they not only handed me the responsibility of the camera, but also the jurisdiction of the sound equipment.

We used the RCA single sound system to reduce equipment and to reduce personnel in that jungle covered country. We kept our equipment down to a minimum, although we did take about four each of everything for an emergency. The thing to suffer mostly, however, was the microphone. We kept the microphone in a humidor in which we had placed Calcium Chloride until a minute or two before we wanted to use it. The damp-sweating atmosphere of Singapore affected the microphone more than any other piece of equipment we had with us. A microphone of the condenser type which we had for picking up the sound is naturally affected more by atmospheric conditions than any other type. Contraction and expansion of the materials directly in line with the picking up of the sound is a serious matter. We kept the microphone, for this reason, in the humidor constantly . . . in fact, we called it the "Mike Incubator." We had to handle it like a sick child. Placing it back in the humidor immediately we were finished, or replacing it with a fresh microphone if we were compelled to expose it to the atmosphere for too long a time.

In my opinion the only successful microphone to use in that climate is the ribbon type. The dynamic mike is affected by the winds . . . the condenser is affected by atmospheric conditions. The Ribbon Mike is the only type available that the atmosphere will not injure in its reproduction values. The ribbon, hanging as it does between the two elements, has a great flexibility in contraction and expansion that is advantageous under tropical conditions.

The three microphones we took with us were completely ruined before we finished with the picture. All of them will have to be rebuilt before they will again be serviceable.

The 35 mm. hand camera was indeed a mighty handy bit of equipment operating as we were. Paul Perry accompanied me on this trip. When he was operating the Mitchell, I would use the small Ica Kinamo which we picked up in Germany to secure close-ups of the animals. We had the apereture of the Ica-Kinamo rebuilt so as to mask out the space usually required by the sound track. But, I found this little camera a mighty ideal bit of equipment under the circumstances in which we worked. It was the first time I had handled this foreign camera and it worked perfectly for me at all times.

The nature of the story also required many street shots. The Ica-Kinamo was pressed into service on practically all of these.

We used the Leica camera for all of our production stills. I mounted my Leica on my viewfinder . . . synchronized the Leica finder with the 35 mm. finder and as the camera ground I would snap the Leica as we went along and pick up the same action as the 35 mm. camera registered for our production stills.

It is more or less a familiar fact to all cinematographers who have worked in the tropics that it is necessary to keep the moisture out of the film before and after being exposed. I have found during my 19 years of travel making pictures in every corner of the world and in every conceivable climate that when working in the tropics it is advantageous to have the raw stock packed in small rolls from 400 feet to 100 feet of film so as not to expose to the atmospheric conditions that might not be used for several days.

Before leaving I had the Eastman company pack this film in small containers . . . seal it with tape and over that seal it with hot wax so as to keep out every vestige of moisture. When we had exposed the film, we put it first in a humidor we had made of a fireless cooker. We had a second fireless cooker for drying the paper in which we would wrap the film. Of course, in each of these humidors we had placed the calcium chloride to attract the moisture. After both the film and paper were perfectly dry we wrapped the film in the paper, placed it in a can and then sealed the

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PHOTOGRAPHY of the MONTH

"SONG OF SONGS"

Paramount Production

photographed by **Victor Milner, A.S.C.**

This production—despite the fact that it was made under a variety of difficult conditions—ranks with the best work that Cinematographer Milner has ever turned out. He gives his well-known lighting skill full play, and makes the most of the many opportunities afforded by sets, locations and action—not to mention doing marvelously by Marlene Dietrich, the star, who has seldom, if ever, appeared to more photogenic advantage.

"Song of Songs," however, is primarily a study in pictorial composition; almost every scene is a compositional gem, well worth the careful study of cinematographers everywhere. The majority of these scenes, too, show the vital part which lighting and light-patterns can play in pictorial composition.

The major flaw that can be found with the production (aside from a weak story, about which the lay critics have already written a great deal) lies, to my mind, in Director Reuben Mamoulian's misuse of the camera in the early sequences. In this portion of the film, Miss Dietrich's characterization is that of a simple German peasant girl; such a characterization is by no means advanced by the use of such a profusion of abnormal angle-shots as have been used. Admittedly, the sets for this sequence provided opportunities such as would try the patience of a cinematographic Job: but Mamoulian's proven understanding of the fundamentals of cinematics should have enabled him to resist these temptations, and hew strictly to the line of his story.

"THE DEVIL'S IN LOVE"

Fox Production

photographed by **Hal Mohr, A.S.C.**

There will undoubtedly be a strong difference of opinion regarding the dramatic worth of this production; but there can be no question of the fact that Hal Mohr, A.S.C., has contributed some of the finest cinematography seen in a long time. In addition to the rich quality that always characterizes Mohr's work, "The Devil's in Love" is an outstanding example of the fine art of utilizing chiaroscuro—light-and-shadow patterns—for pictorial effect. There are many scenes which, without Mohr's pictorial lighting, would have been ordinary to the point of worthlessness, yet which are made outstanding by masterly lighting. Memorable among these is a medium-shot of Victor Jory, the star, as a military court-martial pronounces sentence upon him: just a blank wall, with an immobile soldier standing in front of it; yet by casting upon the wall the shadows of the slanting rifles and bayonets of the guard, Cinematographer Mohr not only gives a striking pictorial effect, but establishes an atmosphere of menace and oppression infinitely more telling than any act or word could portray. Later in the story, a sequence in which the sole illumination used is an ordinary flashlight proves of artistic and dramatic as well as technical interest. Some of the scenes in the tropical village are likewise excellent examples of high-key photography; they are highly atmospheric—one can almost feel the sultry heat portrayd.

One of Mr. Winchell's best orchids is due to Director Dieterle, for his camera-mindedness, and another to Art-Director Max Parker; but the balance of the bouquet is surely the due of Cinematographer Mohr, whose artistry makes he picture seem better than it really is.

"THE MAN WHO DARED"

Fox Production

photographed by **Arthur Miller, A.S.C.**

Sketchily episodic, perforce, this celluloid biography of the late Mayor Cermak of Chicago is made well worth seeing by the intelligent direction of Hamilton McFadden, and by superb photography from the camera of Arthur Miller, A.S.C. The earlier sequences especially abound in striking pictorialism and rich atmosphere. The scenes of the Chicago fire, and the sequences in the colliery, especially, are notable; not to mention the treatment—photographic and directorial—of the mine-disaster. While the later sequences —laid in modern times—do not offer so fruitful a field for atmospheric pictorialism, they are none the less beautifully handled by Cinematographer Miller.

"DON'T BET ON LOVE"

Universal Production

photographed by **Jackson J. Rose, A.S.C.**

It has been some time since we have seen a picture from Cinematographer Rose, for due to an automobile accident he has been inactive for many months; but his recent production, "Don't Bet on Love," proves that his injury did no harm to his camera-craft. On the contrary, despite the limited opportunities vouchsafed him by the story, his work has improved. Always artistic, never conspicuous, it is a fine example of what the treatment of such a plot should be. There is also a most interesting series of optically-printed transitions at the start of the picture, planting the New York locale, and another similar one toward the end, wherein the hero's easily-won bankroll is speedily diminished at the race-tracks. Rose has handled the players excellently (Ginger Rogrs, in particular, should be grateful for his skillful lighting), and made the most of everything placed before his lens. The only technical flaw in the production —an unusually poor crane shot—can hardly be traced to Rose's door, for it is clear that he was in this instance overridden by the impatience of either director or supervisor,

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Photograph by Jackson Rose, A.S.C.

●PROFESSIONAL Criticism of the Amateur picture is a part of the service offered by the AMERICAN CINEMATOGRAPHER. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

AMATEUR SECTION

Contents . . .

Next Month . . .

●AN UNUSUALLY interesting story in Microscopic Photography with the 16mm. camera.

●A PROFESSIONAL will give you his experiences with an Exposure Meter.

●WE WILL TELL you how to equip a Laboratory for development of 16mm. negative.

●IN ADDITION to these there will be other stories that will touch on continuity, more about fine grain development . . . and if our plans do not go awry a story on Slow Motion by a man who has had had much experience in this work.

WHEELS OF INDUSTRY

16 mm. Films of Fair

● Bell & Howell Company announce the exclusive distribution of the Burton Holmes pictures of the Chicago 1933 World's Fair through their dealer affiliations throughout the world.

This series consists of the following subjects: "Around the Fair with Burton Holmes," 400 feet. An abbreviated version of this is available in 100 feet. "Opening Day Ceremonies," 100 feet; "Streets of Paris," 100 feet; "Indian Village," 100 feet; "Wings of a Century," 100 feet; "The Lama Temple," 100 feet; "The Belgian Village," 100 feet; "Enchanted Island," 100 feet, and "The Fair at Night," 100 feet.

Movies to Teach Golf

● The use of motion pictures for teaching golf has been officially adopted by the golf department of the big Carson, Pirie, Scott & Co. department store in Chicago, according to announcement made by Bell & Howell Co. Walter Keller, well-known golf pro, in charge of the store's golf section, is using a Bell & Howell personal movie camera to take slow motion shots of his golf pupils' strokes to diagnose just what is wrong with their play; and then having located the weak points, he proceeds to apply the proper corrective instruction.

Craig Announces New Prices

● In a recent bulletin sent to the trade the Craig Movie Supply Co. has announced new prices on its line of 16 mm. splicers and combination rewinds and splicers, to take effect September 1st. In some instances the reductions have been as high as thirty-three and one-third per cent.

Hugo Meyer Telephoto Lenses

● Two new telephonto lenses for both 16 and 35 mm. cameras are announced by Hugo Meyer & Company. They are their 7-inch and 10-inch f:5.5 Tele-Megor Telephoto lenses.

It is claimed they are particularly useful for extremely long distance shots and in photographing wild life, birds, sports, etc., where the Cinematographer would be unable to secure a picture without the use of an extremely long focus lens.

Booklet on Medical Pictures

● Physicians and surgeons who are interested in making medical, surgical or other scientific films will welcome a monograph entitled "The Motion Picture as a Professional Instrument," prepared by W. F. Kruse, of the Educational Division of the Bell & Howell Company.

Following are some of the topics discussed: The doctor his own cameraman; Developing the scenario; Sixteen mm. film vs. thirty-five; Why is interest in medical and surgical motion pictures increasing; What lenses? Lights or lenses; Focusing; Filters; Color pictures; Micro-motion study; Time-lapse films; Cinemicroscopy; Animation; "Talkies"; Uses of motion pictures in medical schools and hospitals; Films in lay health education and professional societies; The individual practitioner.

The monograph consists of 28 pages and is both comprehensive and concise. It concludes with an extensive and valuable bibliography.

It will be sent free of charge to doctors or hospital executives on application to the Educational Division, Bell & Howell Company, 1801 Larchmont Avenue, Chicago.

Weston Leica Meter

● A special exposure meter has been designed by the Weston Electric Company for use with the Leica camera. This is claimed to be the smallest and most compact of the Weston Exposure Meters. It is similar in design to the Cine Meter turned out by Weston. It is provided with simple conversion tables covering the most popular types of films. The weight is claimed to be only 6 ounces and the meter will sell for less than $25.00. The Leica Meter is calibrated in accordance with the lens and shutter settings on the Leica camera, 1 second to 1/500 second.

New Bass Bargaingram

● Bass Camera Company has just issued a new 16 mm. Bargaingram, listing 18 pages of apparatus and supplies.. This Bargaingram No. 211 is mailed free on request. A new department in this Bargaingram is the listing of a set of thirteen filters.

The materials listed comprise practically everything from cameras and projectors to the many accessories used by the Cinefilmer.

Agfa Consolidated Offices

● The Agfa Ansco Corporation and Agfa Raw Film Corporation have consolidated the Los Angeles and Hollywood branches. This consolidated office is now located at 1043 South Olive Street. The Pacific Coast Technical and Research office has been located at 1426½ North Beachwood Drive under the direction of Dr. Ing. Herbert Meyer. The Olive Street office is under the management of Mr. E. M. St. Claire.

New Model Leica Camera

● E. Leitz, Inc., announces the introduction of a new Model F Leica Camera, one that includes, besides the usual shutter speed range of 1/20th to 1/500th second exposure, slow shutter speeds ranging from one full second to one-eighth second. An interesting feature of this device lies in the fact that intermediate shutter speeds may be secured by setting the index pointer between two calibrated speeds, thus, if the indicator is set between "4" and "8," a shutter speed of 1/6th second will result. The new shutter speed control consists of a tiny, calibrated knob situated near the lens on the front of the camera. It operates independently from the regular shutter speed setting dial located on top of the camera. The slow speeds marked on the dial are 1, 2, 4, and 8, which correspond to 1 second, ½ second, ¼ second, and ⅛ second.

A new magnifier lens is built into the range and view finders of the new LEICA

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Fine Grain

THE negative-positive system unquestionably offers many advantages to the 16mm. worker—especially the ability to make fresh prints at any time, at a moderate cost. Unfortunately, however, it has also gained the reputation of being undesirably grainy—which in the minds of many users more than offsets the advantages offered Since inquiry shows that most 16mm. negative film is coated with the identical emulsion used for the same manufacturers' highly successful 35mm. product, this writer has frequently doubted the justification of this reputation. The 16mm. picture is, roughly speaking, about half the size of the 35mm. image; it is rarely subjected, in projection, to any enlargement even remotely comparable to the tremendous magnification generally practiced in our larger theatres; and even though the 16mm. audience is often much nearer the screen, proportionately, than is the theatrical audience, why should the graininess of the two identical emulsions be so greatly disproportionate?

Careful consideration of the problem will show that the only point in the lines followed by 35mm. and 16mm. film from factory to screen, at which there is an appreciable degree of divergence, is in the developing laboratory. It must be admitted that few commercial film laboratories are in a position to be so painstaking as are the specialized plants devoted to the processing of a studio's negative. It is likewise well known that the grain-producing characteristics of different developing solutions vary considerably; and, further, that those producing the finest grain are as a rule more expensive, and require more care in compounding and manipulation than do the more familiar ones which produce a larger grain.

Such being the case, the only solution to the problem was obviously to experiment personally with 16mm. negative and a variety of the fine-grain developers recommended by the various research engineers. The results have more than justified the experimentation, for the finest-grained results produced have shown that 16mm. negative film, properly processed, will give results absolutely comparable to reversal emulsions. Compared with reversal film by simultaneous projection on a ten-foot screen, I have found little or no difference in grain characteristics between comparable scenes made with the same equipment on reversal and negative films.

The equipment used for processing negative film, while important in itself, is of less importance than the developing solutions used. Almost any method will suffice—pin-racks, Stinemann racks, "Correx" apron-rolls, or (in the case of short lengths) revolving drums—so long as the operative procedure is correct.

Since the majority of cine-amateurs have had more or less experience in still photography—including developing and printing—it is hardly necessary to state that negative development requires two chemical solutions—the developer and the fixing-bath—and at least two (preferably three) intermediate washings in cold water. The best method is to put the film on the rack, immerse it for a few minutes in cold water (this promotes better and more uniform chemical action, and retards the formation of air-bubbles); then immerse it for the required time in the developer, agitating it by lifting the rack up and down a few times immediately on immersion, and also several times during the developing process; then immerse the film again in cold water, to clear away the developer before immersing in the acid hypo fixing-bath; then, after fixing for eight to ten minutes in the typo (the regular Eastman Acid Hypo is excellent for this purpose), wash in running water for at least twenty minutes, and dry. All operations up to and including the first minute or two in the Hypo should be done in total darkness.

Throughout all of these manipulations, three things are of paramount importance: absolute cleanliness; protecting the film from any dirt or chemical impurities (for which reason distilled water and filtered solutions are always preferable, though in some localities the regular tap water may be adequately pure. Tap water can, of course, be used for the washing.); and thirdly, protecting the film from anything which might scratch or mar the soft emulsion. All of the solutions, too (including the rinsing-water) should be kept cool, between 65 and 70 degrees Fahrenheit, so that the emulsion will not be unduly softened. All solutions should be kept at as nearly uniform a temperature as is possible.

Enlargement from 16mm. negative developed by ordinary commercial laboratory. Note greater graininess. Both illustrations made on DuPont Panchromatic 16mm. Negative film, with same camera and lens. Enlargements by Gilbert Morgan.

As far as the developing solutions themselves are concerned, the production of truly fine-grain results demands highly specialized developers. It is true that motion picture film **can** be developed in any solution that can be used for ordinary still photographic negatives; but this is not desirable: for really good results, it is imperative that the formulae specifically devised for cine-film processing be used. It must be remembered that the problems involved in still photography and cinematography are decidedly different. One of the most outstanding if the features which differentiate the two is the vital importance of grain-size. The tremendous enlargement demanded of a motion picture image is many times more exacting than anything normally demanded is still photography. In the latter, we rarely go beyond an 11x14 inch print: and even when miniature-camera negatives are used, the enlargement is in no way comparable to that involved in projecting 16mm. picture—less than ½ inch square—onto a five or six foot screen. (And it must be remembered, too, that with modern equipment many users of 16mm. employ screens ten feet or more in width.) Professional experience has proven that we can only go a certain distance in this direction before being stopped by the fact that the grain of the emulsion becomes enlarged to the point of objectionable visibility.

Scientific investigation has proven that the grain in positive film is so small as to be negligible: accordingly, any steps toward fine-grain results must be taken with the negative. Normally speaking, the actual grain-size of either 35mm. or 16mm. negative emulsions is such as to be within satisfactory limits. Unfortunately, however, many develop-

Developing For 16 mm. Negative

by
William Stull, A.S.C.

Enlargement from 16mm. negative developed in Paraphenylene-Diamine developer. Note fine grain.

ing agents and formulae act in such a way as to artificially accentuate this grain—or, to be exact, the graininess. According to the researches of such scientists as Dr. C. E. K. Mees, A.S.C., and Dr. V. B. Sease, A.S.C., the appearance of grain in motion picture film is not due so much to the actual size of the silver grains in an emulsion as it is to the fact that many developers have a tendency to cause the grains to move physically in their supporting gelatin, and clump together in irregularly-shaped particles which, on projection, become individually visible as single grains. The problem is to find a developing agent which will satisfactorily develop the latent image without causing this clumping which gives rise to graininess.

There are a number of excellent developing-solutions suitable for this work: the most satisfactory, however, are the so-called "Borax Developer," such as the Eastman D-76 formula, and the DuPont Borax formula; and the Paraphenylene-Diamine developer, which—though it has some disadvantages—nevertheless gives unquestionably the finest grain obtainable.

Borax Developers

Probably the best-known of the so-called "Borax Developers" is the Eastman "D-76" formula. While this is described in both volumes of the CINEMATOGRAPHIC ANNUAL, I will repeat it here:

D-76

Elon	120 grains.
Sodium Sulphite (E. K. Co.)	14 ounces.
Hydroquinone	300 grains.
Borax	120 grains.
Water	128 ounces (1 gallon).

Owing to the high concentration of sulphite, this is rather difficult to mix unless done in the following manner: dissolve the Elon in a small quantity of warm water (about 125 degrees F.), and add this to the tank. Then dissolve approximately one quarter of the sulphite separately in hot water (about 160 F.) and add the hydroquinone, while stirring, until completely dissolved. Add this solution to the tank. Then dissolve the remainder of the sulphite in hot water (160 F.) and add the borax. When dissolved, pour this into the tank, and dilute to the required volume and temperature with cold water or—if necessary—ice.

The development time for this solution (for a normal negative, of course) is 10 to 15 minutes at 65 degrees Fahrenheit. The life of the solution is quite long, if it is kept in a well-stoppered bottle when not in use; as the solution ages, of course, the development time increases. This developer may be revived once or twice during its life by the addition of half the quantity of borax originally used. With use, the developer may become slightly muddy, due to a suspension of colloidal silver in the solution; the tank also becomes coated with a thin, white deposit of silver: but both of these effects are harmless, and can be ignored.

DuPont Borax Developer

A somewhat similar solution is the DuPont Borax developer, which may, of course, be used with any type of film, just as the D-76 formula which originated in the Eastman laboratories, is quite satisfactory for DuPont film.

Rhodol (Metol, Elon, etc.)	2.5 grams.
Sodium Sulphite (anhydrous)	75.0 grams.
Hydroquinone	3.0 grams.
Borax	5.0 grams.
Water to make	1 liter.

Development time: 5 to 7 minutes at 68 F.

The Borax developers are highly satisfactory, and give a far finer grain than is generally obtainable with commercial 16mm. laboratory service. The Paraphenylene-Diamine developers, however, give a much finer grain; the finest grain, in fact, thus far known. They are attended, on the other hand, by certain disadvantages, including (due to their strong alkalinity) a marked tendency to irritate sensitive skins (this can, of course, be overcome by wearing rubber gloves); poor keeping quality; and a requirement of extra exposure and longer developing time. Some of them give a rather high degree of contrast also. The following solution, which I have tried with great success, requires DOUBLE NORMAL EXPOSURE (that is, one stop larger than would otherwise be required), and a developing time of 30 minutes.

Paraphenylene-Diamine Developer

For Twice Normal Exposure

Paraphenylene-Diamine	540 grains.
Sodium Sulphite (E. K. Co.)	7 ounces.
Water to	120 ounces.

Developing time: 30 minutes at 68 F.

The Paraphenylene-Diamine is dissolved in hot water (160-180 F.) and when thoroughly dissolved, the sulphite is added. The remainder of the water should be made up with cold water or ice.

This solution is normally of a purplish-brown color, and has a certain mild dye-toning effect upon the image, giving it a cloudy yellowish appearance by reflected light: this does not, however, impair its printing quality except, per-

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Upper photo shows fine engraving by hand through a magnifying glass. Lower photo is close-up showing routing machine in operation.

An Amateur Makes An Industrial

by
Edward J. Schon

WHEN I started out to make a moving picture showing how engravings (or cuts) are made I had absolutely nothing to guide me. As far as I know, no serious attempt had ever been made to show the "Art" of Photo-engraving in pictures. When one stops to consider the intricate details that go into the making of printing plates and the seeming impossibilities of photographing the numerous operations involved, one would well wonder that a mere amateur would even attempt it. Nevertheless, I did attempt it and it turned out to be one of the best achievements I have to my credit.

I started out, of course, with a very definite outline. Each shot was planned in advance. I made all my titles in advance, developed them and spliced them in sequence. Whenever the opportunity presented itself, I shot the different scenes in the shop and as the films were returned from the processing station, they were spliced in behind their proper titles.

Many of the scenes were real problems photographically. For instance, I succeeded in getting a shot inside of a nitric acid etching machine in operation. Another was one looking down through a large magnifying glass, showing an extremely delicate hand engraving process. Actual developing of a wet plate was accomplished (by a trick). The dark room scenes were toned a deep red, to give them the proper atmosphere.

Practically every foot of film shot was used. I had very little waste, as each shot was carefully planned. Not one scene was taken over. The film was shot at odd times covering a period of four months. Four ordinary arc lights, found in any engraving shop, were used, which supplied sufficient light to stop down to F. 16 which assisted me very materially in getting the extreme sharpness in the closeups.

An ordinary Bell and Howell camera was used, with an F. 3:5 universal focus lens. Focusing was accomplished by unscrewing the lens from one-quarter to one full turn. I had, of course, made previous tests as to just how far to unscrew the lens from the different distances. With the four arc lights I was able to get very good top and back lighting. A tripod was used wherever possible.

When the picture was assembled and edited, I had a picture of four reels and showing time of about 45 minutes. The president of our local Craftsman's Club had been insistent that our firm put on a program and so the film was presented for the first time to a group of printers.

I hope you will not think I am boastful when I say that this meeting brought out the largest turnout the Portland Club has ever had. Almost one hundred printing house executives were there. I don't believe that they were there to see the picture just because I made it, but because they wanted to see how engravings were made. Many of them had, of course, been through engraving shops but yet there was much they wanted to know. They were there because my picture had filled a certain need.

Without knowing it, I had succeeded in putting into this picture a certain psychology which has had the effect of a more favorable attitude toward engravers. When my picture came to an end, the audience stood up and applauded, the equal of which I never experienced before. Customers came to me and said in effect, "How in the world can you give such fast service when a cut has to go through all those operations? I never realized how much I have exacted from you on rush work."

Well, to make a long story short, the news of the film was soon circulated in many trade journals. I made absolutely no attempt to advertise the film myself. Requests for the loan of the film came from every section of the country. Mostly engravers asked for it and many requests had to be turned down. Engravers from San Diego to Boston showed it to advertising clubs and other organizations. Whenever possible, I showed the film at high schools and various classes, and I can assure you that the results were very gratifying.

Edward J. Schon

In the producing of an industrial film as an advertising or good will agency, it is my opinion that nothing can equal it for results. It can be the instrument for molding public opinion in a favorable way towards its sponsor. Problems of many kinds can be overcome by the showing to

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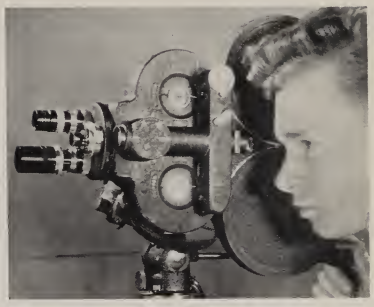
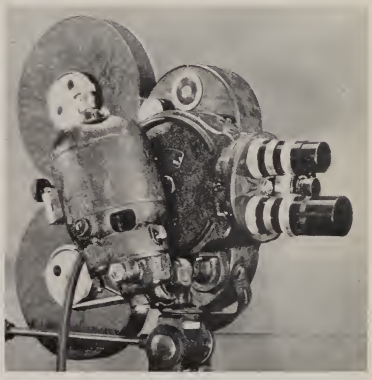
B & H Special Semi-Professional 70D 16mm. Camera

by
J. A. Dubray, A.S.C.





Showing both sides of the B & H Semi-Professional 16 mm. camera. Upper photo shows use of finder arrangement.

IT IS with a view to increasing the efficiency and versatility of the FILMO Model 70 Camera that the Bell and Howell Company has recently designed a series of attachments that can be adapted to any of the cameras in existence and which bring this apparatus to such a completeness of refinement that it can be classed as semi-professional, without at the same time eliminating the possibility of taking full advantage of the features of portability and ease of operation that have been responsible to a great extent for the success with which this type of camera has been received by amateur cinematographers.

These new accessories and attachments consist of three major units:

A film magazine of a capacity of 200 feet.
A driving motor, and
A range finder.

Each one of these units is independent from the other and can be adopted or discarded at will.

The film magazine is of the two-compartment type as used in the Bell and Howell professional camera. The film is "loaded" into one of the compartments, made to pass through two valve openings and its loose end is fastened to the empty reel in the take-up compartment.

The valves are light-proof, so the film is fully protected from fogging.

In order to load the camera, a loop of film is pulled from the magazine and inserted in a special opening cut in the rear of the camera. The magazine is then screwed fast to the camera and the film is threaded through the camera sprockets and movement in the customary way.

When the camera door is locked a special prong automatically opens the magazines' valves and the film runs through two wide slots, eliminating all friction and consequent evil of scratches and abrasions.

If for any reason the magazine is withdrawn from the camera before the 200 feet is all "shot," the action of opening the camera door causes the magazine valves to close automatically and the only film lost is the small length of the loading loop.

While the camera is in operation the raw film, which is in the upper compartment of the magazine, is fed through the intermittent movement by the feed sprocket and is led towards the lower compartment by the take-up sprocket. The winding of the film in the magazine is secured through a spring belt which is actioned by a gear and pulley system part of the camera and which in turn, actuates the take-up pulley of the magazine and the take-up shaft which is integral part of the pulley.

The protruding of the magazine back of the camera would interfere with the ease of watching the field of view through the finder. To remedy this, the finder eye-piece tube is set at a conveient angle and a prism of proper deviation connects this angular setting so that the finder image can be viewed comfortably even by persons wearing glasses.

Since 200 feet of film are now available in the camera, means have been provided so that the whole length, or any part of it, could be run without interruption and to this end a driving electric motor has been adapted that can be operated through the regular house line current, or through dry batteries.

The adaptation of the motor requires the installation in the course of a system of gears which are set in motion either by hand crank or by the motor. This particular installation is called the "hand crank" device and does not alter ostensibly the outer appearance of the camera.

The use of the hand crank for normal shooting is possible but not recommended especially because of the greater assurance of steadiness of the motor drive.

The motor, through its shaft, is easily attached, at a second's notice, to the camera and the pressing of the button that closes the electric circuit sets the camera in operation

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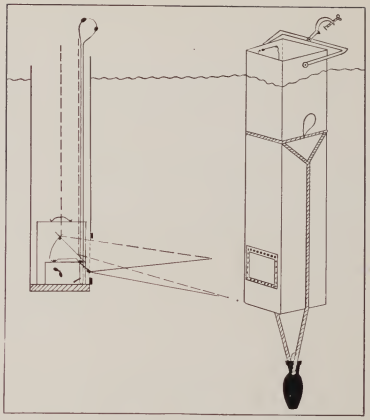
Making Movies Under Water

by

Joseph Walker, A.S.C.
As told to Walter Blanchard



Home-made under water camera tube. Left showing camera and finder. Right showing construction and ballast.

EVER since the release of the picture, "Beneath the Sea," which I photographed, amateur cinematographers have asked me and written me, "How did you make those underwater shots? And how can I make 16 mm. pictures under water?" Personally, I don't think that the first of these questions has much bearing on the second one, for in a case like this, the professional cinematographer has it all over his amateur cousin: he can have a lot of special apparatus built whch the amateur couldn't afford—and wouldn't care to cart about wth him if he had it; moreover, he can—thanks to the skill of the cutters—combine scenes made in the studio tank, out-and-out trick scenes, and bona-fide underwater stuff so intricaely that even an expert can hardly say which is which when he sees the finished picture. None the less, real underwater films are possible—and very interesting.

Th apparatus used in making professional underwater films varies tremendously: some of us have used a sort of diving-bell; others have used diving-suits and watertight boxes for the camera; Mack Sennett, the comedy-producer (whose hobby is fishing, you know) used an amazing contraption with the lens and movement at the bottom of a long tube, and the film-magazines, finder, motor, etc., extended to the top of the tube; while the earliest underwater films, photographed in 1916 by Carl L. Gregory, F.R.P.S., for the Williamson brothers, used the Williamson tube—a round metal chamber hung at the bottom of a long tube through which the operators descended from a boat that bore the apparatus. Surprising as it may seem, this principle is probably the best one for the amateur filmer! Don't get the wrong idea, though—I don't recommend going to the expense of building a Williamson tube for making a few 16 mm. shots under water! Far from it—but the basic idea of an open-topped tube, with the camera at the bottom, is ideal for the needs of the average 16 mm. filmer.

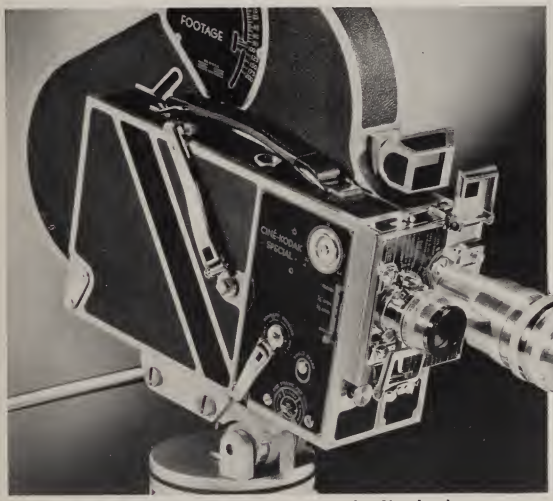
Recently, in our interesting French contemporary, "Cine Amateur," M. A. Thierry outlined such an outfit which, to my mind, fills the bill perfectly. As can be seen from the illustration, the apparatus consists of a square tube of galvanized iron, open at the top but closed solidly at the bottom. At the front, at an appropriate distance from the bottom is a glass window, made water-tight with cork or sponge-rubber gaskets. For this purpose, optical glass would be best: but it is expensive (especially as we need a good-sized window), so good, clear plate glass will do. Midway up the tube wrap a rope—or even better, solder or weld on four loops of wire rope—and from this drop a loop of rope below the end of the tube, and secure it to it a sack of rocks, to sink the tube to the proper depth. You can also put a couple of rope handles on, to aid you in aiming the tube, if you wish. At the top of the tube you can either fix a couple of loops of rope, with which to hang the affair over your shoulders, or make a swivel-clamp by which the tube can be fixed onto the side of the boat; personally, I would prefer this latter idea. All that is necessary is a U-shaped arm of ordinary pipe, with the tube pivoted between the open ends of the U, allowing the tube to be swung between them; and a similar pivot-joint at the middle of the U so that it may be "panned" as well as "tilted." This clamp terminates in an ordinary carpenter's clamp, so that the device can be clamped onto a boat like an outboard motor.

Now for mounting the camera! Probably the easiest way to do this is to make an L-shaped wooden piece which will drop into the tube, and mount your camera on this. The camera, of course, will sit on the short arm (or is it foot?) of the L, while the upright will serve as a handle. It should be held in place by a regular tripod-screw, the knob of which fits into a countersunk hole on the lower surface of the base-board. Above the camera is a good mirror set at a 45° angle, to serve as a finder. (After a test or two you can rule on the window of the tube lines which will give a rough approximation of the field your lens covers.)

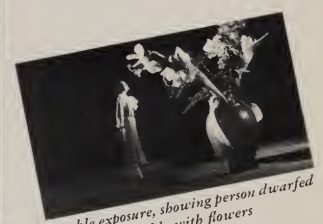
Now, with your camera at the bottom of this tube, and you at the top, you will have to have some type of remote-control: just exactly what type must, of course, depend upon the camera you are using. With a Filmo, the simplest thing is to use the regular Filmo rubber-tube-and-bulb remote control; with other cameras, the electric remote-control made by Wm. J. Grace, of Dallas, Texas, will serve

(Continued on Page 150)

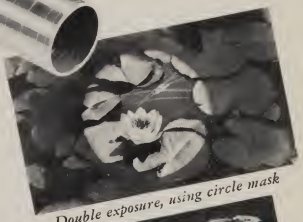
Open Hollywood's Bag of Tricks!



Ciné-Kodak Special, equipped with 200-foot film chamber

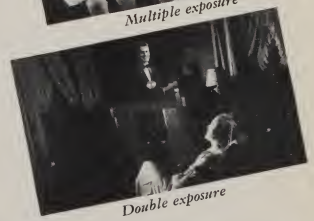


Double exposure, showing person dwarfed on table with flowers



Double exposure, using circle mask

Multiple exposure



Double exposure

CINÉ-KODAK *Special*

challenges the highest movie making ambitions

PRECISION-MADE, custom-built, Ciné-Kodak Special is a professional-type home movie camera of unparalleled ability. No other 16 mm. camera offers the advanced amateur such unprecedented scope.

Its variable shutter permits the making of fades and dissolves, the recording of fast action in sharper images, additional exposure control under intense light. It has two hand-cranking shafts—an eight-frame and a single-frame—and may be operated by electric motor as well.

Its reflex finder shows the field and focus on a ground-glass screen. Interchangeable 100-foot and 200-foot film chambers allow instant switching from one type film to another. Its lens turret accommodates two of the six available lenses at one time.

A basic model, equipped with an *f*.1.9 lens, set of six masks and one 100-foot film chamber, is priced at $375. Additional equipment or special adaptations furnished to order. Write for the Ciné-Kodak Special Book.

IF IT ISN'T AN EASTMAN, IT ISN'T A KODAK

EASTMAN KODAK COMPANY, *Rochester, New York*

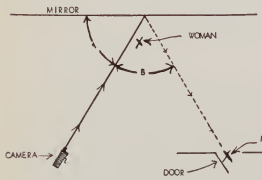
HERE'S HOW

by A. S. C. Members

ACTION IN A MIRROR. "A girl is fixing her hair or powdering her face when a man comes in the door. This door is directly behind the girl, and she sees his reflection in the mirror as he comes into the room. How can this be done without photographing the reflection of the cameraman, yet getting the reflection of the man, etc., in the mirror?"

B. S., Petaluma, Cal.

● The answer is simply to put your camera at one side of the girl, and shoot past her into the mirror. I'm sure you've noticed that often when you look into a mirror from an agle you will be able to see things directly in front of the mirror, or at a corresponding angle on the other side, but not your own reflection. What you have to do is put the camera in a similar position, so that it can see without being seen; it all works down to the old proposition we remember from our high-school geometry, that "the angle of incidence is equal to the angle of refraction"—in other words, angle "A" on the diagram is equal to angle "B." If you place your girl approximately as shown, about on the centerline or a bit to the same side of it that the camera is, you will shoot over her shoulder, showing her back, and get the reflection of her face, as well as that of the wall, the door, and the man enter-



ing. It must be remembered in focusing, to focus, not for the distance between the camera and the mirror, but to set the scale for the combined distance from camera to mirror to subject.

WM. STULL, A.S.C.

Correction

There were several errors on this page last month in the answers to the questions which were submitted to the amateur. In question 5—the answer stated all 16mm. cameras operated at a speed in the neighborhood of 1/32"; this should have read "1/32 of a second."

In question 14 the query was made: "When using Regular Panchromatic Film the stop is f.8 What should you use with Supersensitive Panchromatic Film? The answer gave F.16 as the opening. This should have read F.11.

It was gratifying to note the great number of amateurs who caught this latter mistake. It was, of course, taken for granted by all of the readers that the word inch instead of second was just an oversight by the proofreader.

STUDIO STILLS. "Are the 8x10 glossy prints displayed in the lobbies of theatres, made from 8x10 negatives or are they enlarged from smaller negatives? If they are made from 8x10 negatives, why? Would it be possible to obtain equally beautiful results if the negative was, say, 2¼x 3¼, provided the negative did not require retouching?"

Miss M. L. C., Columbus, Ohio.

● Practically all still pictures are made in the studios—production stills, portraits, publicity pictures, reference stills, and the like—are made direct on 8x10 negatives. The number of stills required is so large that this standardiization effects very considerable economies simply by standardizing equipment, materials and methods. In addition, the results attained by contact printing are superior to those attained by enlarging, when mass-production is considered. Enlarging is also slower and more expensive, and retouching the larger negatives is easier and less noticeable.

On rare occasions—such as action stills of chases, fights, etc., and for "candid camera" publicity pictures—a 5x7 Graflex is used with either filmpack or cut-film. These negatives are usually enlarged to produce 8x10 copy-negatives for volume printing, but the results are not nearly so satisfactory as direct 8x10 contact printing. A few attempts have been made to use the "Leica" camera for this work, for production stills, and for special stills of miniature or special-process sequences, but the difficulty of getting good enlargements cheaply, on a mass-production basis, has kept most of the studios on the 8x10 negative.

As regards the last part of your question, it is absolutely possible to get beautiful results from small negatives and enlarged prints—witness the fine work that can be done with the "Leica" and "Contax"—but it is not practical as a mass-production matter, where time and expense must be reduced to the minimum, and everything must be standardized. For individual use, for pictorial or scientific photography, or for newspaper "candid camera" work, or for the relatively small volume of a portrait studio, the small-negative-enlarged-print idea is excellent, but it has great disadvantages for mass production.

KARL STRUSS, A.S.C.

FILTERS FOR AERIAL PHOTOGRAPHY. "During a trip to Europe last year, using a deVry 35mm. camera and Eastman Greyback Panchromatic film, I flew over the Hartz Mountains and shot a number of scenes. The exposure seems about right, but the picture is hazy; I have since learned that there are filters made specially to cut through this haze; can you tell me what this is? Also, I am planning to make a scenic of New England this year: what are the best filters for this, especially for cloud-effects and extreme contrast?"

A. W. K., Yonkers, N. Y.

● The filter you want for aerial work is the Wratten "Aero 2," which was made especially to cut aerial haze. The Wratten "C" filter is also very useful in the air. The best assortment for use in your scenic would probably be the "Aero 2," the "G," and the "23-A," with the "72" or "Gamma" filter if you want to make night-effect shots by day, and the "29-F" for extreme overcorrection and contrast. I suggest that you read Elmer G. Dyer, A.S.C.'s article on "Aerial Cinematography" in Vol. 2 of the "Cinematographic Annual," and "Filters and Filter-Factors," by Emery Huse, A.S.C., and Gordon Chambers, in the December, 1931, issue of "The American Cinematographer."

JOHN ARNOLD, A.S.C.

Greenbrier Stein Party Big Success

● Beer must be officially back. At least there is some sort of record or other made by the Greenbrier Amateur Movie Club of the event.

June 16th marked a wow of a party, according to Hal Morey, secretary of the club. Rathskeller atmosphere, Bock beer signs, frothing glasses and a program that contained the words of popular songs were a part of the evening's festivities. Of course, the record made was on 16 mm. Focus not guaranteed.

Muros Has Novel Sun Shade

● The accompanying illustration of the sunshade and filter holder designed by Joseph Murcs, Cinefilmer, clearly demonstrated the fine manner in which his lens is shaded at all times.

It is made to take the standard 2-inch filter, gauzes, etc. When using the visual focusing device the shade can be folded down away from the lense without removing it from its support. This support has been built as an integral part of the tripod head.

According to Muros' description, all metal parts are made of duralumin, which makes the entire unit extremely light but quite rugged. By being able to extend the bellows the hood can be adapted for lenses of various focal lengths so as to cut off all possible stray light.

Over Sixty Theatres at Fair

● Visitors to A Century of Progress Exposition in Chicago will have the opportunity of seeing over sixty movie theatres on the fair grounds, according to the Bell & Howell Company, Chicago.

These movie theatres are of all sizes and descriptions, ranging from the big theatres of "Hollywood in Chicago" where visitors can witness the making of regular professional movies in the veritable Hollywood manner, to the smaller but always interesting movie show places in the exhibits of industrial companies and railroads, and in displays made by a number of U. S. Government departments and several of the states.

An Amateur Makes an Industrial

(Continued from Page 142)

prospective customers. Salesmen can break down resistance barriers with it. Regardless of the product or service you have to sell, it can be forcefully and efficiently presented by movies.

The cost of putting into circulation a film, such as was sponsored by our firm, was small in comparison to the amount spent in other forms of advertising. Here we had a medium, which no matter what the cost, more than brought back the money spent. I know from my own experience en the small way in which I have presented this project, that it has brought our firm a tenfold benetit in results. This is not theoretical; it is actually true. No other form of advertising has come anywhere near to bringing our firm the good will which this simple amateurish attempt has done.

A Super-Portable Background-Projector

(Continued from Page 134)

means, he states, he controls the "hot-spot" in all cases, projecting it to any part of the screen he desires and almost eliminating in the most dense portions of the picture.

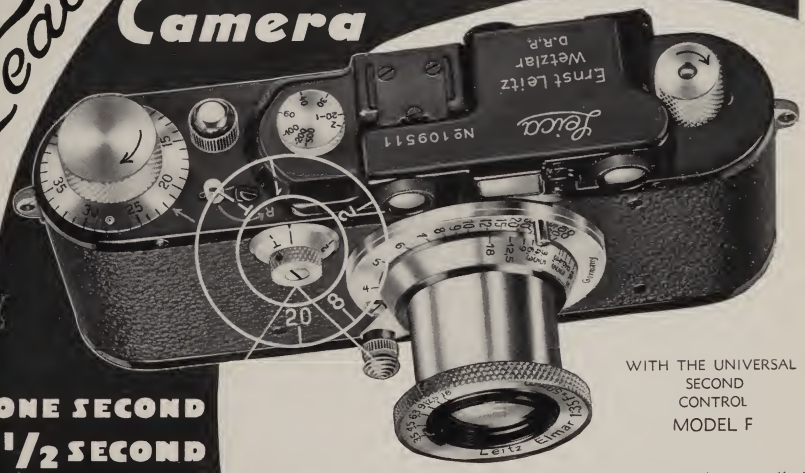
As can be seen from the illustration, the new projector is relatively small—its greatest width is 30 inches—and capable of going anywhere a blimped camera can be used. It will pass through any door, and can be quickly set onto or removed from parallels, etc. It is light and extremely portable, yet rigid; it produces rock-steady pictures, and is capable of exceptionally accurate synchronization. Too many times in the past, Mr. Teague states, he has found that lack of this adjustment has injured scenes which—though apparently in synchronization—have been actually several degrees from perfect synchronization.

The new projector is surprisingly quiet, even though steadiness has been the aim of the design rather than noise-reduction. In actual use, the head is fitted with a small but effective blimp; in this way, absolute silence is secured, without sacrifice of portability.

The present device is in operation by Mr. Teague's firm, the Synchro-Composite Process Co., at the Western Service Studios. It is probable that these projectors will be commercially manufactured by Mr. Teague and his associate, Wm. Stinekamp, who was formerly Camera Executive at the Fox Studio. The device is also scheduled for exhibition before the American Society of Cinematographers at a forthcoming meeting.

Again Leica Leads the Way!

The Greatest Range of Shutter Speeds in Any Camera



WITH THE UNIVERSAL SECOND CONTROL
MODEL F

ONE SECOND
1/2 SECOND
1/4 SECOND
1/8 SECOND

and fractions between

IN ADDITION TO *REGULAR* SPEEDS OF 1/20 TO 1/500 SECOND

Now the LEICA Camera MODEL F has mastered the complete second! For the first time a camera with a **focal plane shutter** makes possible speeds of 1, ½, ¼, and ⅛ seconds, including all intermediate speeds, **in addition** to the regular speeds between 1 /20th and 1 /500th seconds. Instantly set for any speed. No confusing scales to adjust.

Accuracy and scope of shutter performance that is unequalled by any other camera today. Night photography, indoor, still life, portrait, architectural, press photography, have broad new possibilities with this range of shutter speeds, especially when used in combination with the new super speed films.

And here is another new LEICA feature:
MAGNIFIED FOCUSING IMAGE

A new optical system provides for the magnification of the image seen in LEICA'S built-in range finder compensating for differences in eyesight.

Other modern features by which the LEICA Camera sets the standard for speed, accuracy, and convenience of picture taking:

1. Eight interchangeable lenses for every photographic need (including telephoto, speed, wide angle lenses and others).
2. Over 300 accessories and attachments to choose from.
3. Built-In Short Base Range Finder gives you perfect focus instantly. No guesswork.
4. 36 pictures from a single roll of standard cinema film. (Sharp negatives. Enlargements up to 12 x 18 inches.)
5. Small, light, compact, fits the pocket.

Write for free illustrated booklet "Why LEICA?" and also booklet 1216 giving complete information about Leica Model F.

LEICA now offers the new **WESTON LEICAMETER**, smallest and most compact of Weston Exposure Meters. Fits the hand. Gives the answer for correct exposure instantly, insures sharper, clearer pictures, saves film spoilage. Ask for circular EL.

E. LEITZ, Inc., Dept. 332
.60 East 10th St.. New York

Fine Grain Developing For 16mm. Negative

(Continued from Page 141)

haps to give a desirably increased density and contrast. One cannot recommend this developer for badly underexposed negatives, however.

Dr. V. B. Sease, A.S.C., of the DuPont Research Laboratories, recommends the following modification of this formula, which is used with great success in DuPont's commercial processing of their product in the New York area. It does not require increased exposure.

Paraphenylene-Diamine-Glycin Developer

Paraphenylene-Diamine	10 grams.
Sodium Sulphite	90 grams.
Glycin	1 gram.
Water to make	1 liter.

Developing time: 22 minutes at 68 F.

There is one phase of development with which too few non-professional cinematographers are acquainted: this is, the adaptation of the developing procedure to the needs of the individual negative. In the studios—as can be seen from an article on professional laboratory practice by Fred Gage, A.S.C., which appears on another page—great reliance is placed on the laboratory test system, by which the cameraman makes a short test-strip for the laboratory to use before developing the entire roll. The wise professional invariably makes such a test after each change of lighting, or any important change in the camera set-up or other major photographic conditions, notching the film so that it can be removed in the darkroom, and handled separately. The amateur or non-professional can well follow this example. It may not be possible to make a test after each change of conditions, but at the very least, one should invariably allow two or three feet on the end of every roll as a laboratory test, which can be developed before the entire roll is put through. If such a test—it need only be a foot long—is broken off the roll and developed at normal time and temperature, you can easily find out from it whether the body of the roll will require normal development, over-development, or under-development, and treat it accordingly. The development of the semi-professional 16mm. cameras, such as the new Eastman Special, with its easily interchangeable magazines, should facilitate the making of such test strips even in the middle of a roll. And with adequate tests, and the latitude permitted by controlled development, coupled with the control permitted in printing the positive, the negative-positive system allows a tremendous degree of control, enabling one to compensate for exposure errors to a surprising extent—not to mention making night-effects and other special effects exactly as desired. 16mm. negative development is not at all difficult, and since, in addition to giving exceptionally fine results (bringing the grain and quality of negative-positive results into close parity with what is obtainable on reversal films), it is tremendously interesting in its own right, it is decidedly well worth trying.

Making Movies Under Water

(Continued from Page 144)

perfectly: or, if you want to build your own, you can, by simply pivoting a metal arm (a piece of "Meccano" will do for this) so that it will depress the release-lever of your camera, and attaching two strings by which the lever can be worked both ways from the top of the tube. (It will simplify working this if you run the string through eyelets at the top of the tube and on the base-board.)

In actual operation, you mount your tube, wind and focus the camera, and fix it to the wooden base-board which is lowered into the tube. Then, by leaning over and looking down the tube, you can follow your subject, and when things are right, jerk the release-string, or squeeze the bulb, as the case may be—and there you are! Since the tube is pivoted, you can pan and tilt it to follow your subject; then, when the scene is over, you can stop the camera—or, if it has run down, you can pull it up, rewind, and go on shooting.

Your exposure will depend, naturally, upon the light and water conditions; however, such a device as this does not sink the camera very far below the surface—certainly not more than three or four feet—so, granting a good day ,with strong sunlight shining down into the water, and clear water, you will only need to increase your exposure by one stop over what would be normal on the surface. Filters will hardly be necessary, for in most underwater work you will find the range of visibility very limited; you will be restricted to relatively near subjects. I would recommend Super-Sensitive film for underwater work, not alone for its added speed, but also for its better color-sensitivity. Incidentally, it should be possible—under the best condition—to get some unusually interesting scenes in Kodacolor, using Super-Sensitive Kodacolor film. Dan B. Clark, A.S.C., has shown me some very interesting Kodacolor, made from a diving submarine even before the Super-Sensitive variety of color-film was available; and I have also seen some extremely fine un-

derwater Multicolor, made for Mack Sennett by John W. Boyle, A.S.C., and Frank B. Good, A.S.C.

Theoretically speaking, the refraction of the water should be an important factor in focusing. The index of refraction of water is 1.3—and this should serve as a good working guide. Actually, you will find that with the short-focus lenses used in 1 6mm. cameras, and the relatively small stops used, this difficulty will be minimized. In every phase of the work, however—focus, exposure, etc. —you will find that since everything varies according to the individual conditions of the moment, the only sure guide is to make tests, and govern your actual scenes accordingly.

New Development in Carbon Arc Lighting

(Continued from Page 131)

current coil actuating in armature, and various mechanical means were used for transmitting the armature movement to the two arc systems of the lamp.

In the new lamp which Mole-Richardson have designed, each of the two series arcs are controlled by an individual system of energizing coils, armatures, and connecting linkage, which permit the independent control of each pair of electrodes in relation to the voltage drop of the arc which each respective system controls.

The new control device obviates the blinking and sputtering, with the incidental noises, which made it quite impractical to use the old type of broadside in conjunction with the sound recording apparatus.

This new lamp has gone through a series of practical tests which indicate that it has amply met the requirements of specifications Nos. 3 and 4 in matters of uniform light quality and quiet operation.

The high illumination afforded has been made possible through the co-operation of the National Carbon Company, whose Research Laboratory has done such notable work in the application of the carbon arc to photography and in the projection of motion pictures. Through the fine co-operation of this research organization a new type of Flame Arc carbon has been developed which greatly increased the intensity of the radiation. The spectrum of this carbon has a photographic characteristic closely comparable to north sunlight. From the practical tests undertaken photography made in motion pictures stages may be readily matched to shots taken in sunlight with no disturbances of the color balance.

While these lamps have been designed primarily for use in color photography, they will undoubtedly be of interest to all cinematographers operating in black and white.

A.S.C. Aces in Satevepost Story

● The July 22 issue of the "Saturday Evning Post" is attracting widespread attention in motion picture circles, due to an unusually interesting feature-article, "Aces of the Camera," by Palma Wayne. Mrs. Wayne, one of the Post's leading staff writers, brings to the attention of the "Post's" world-wide circle of readers the personalities and achievemnts of a group of the leading members of the American Society of Cinematographers, including Karl Struss, A.S.C.; Victor Milner ,A.S.C.; William Daniels, A.S.C.; Charles Lang, A.S.C.; Hal Rosson, A.S.C.; Ray June, A.S.C.; Charles Stumar, A.S.C.; Lee Garmes, and others

In this article—the first of several to be published in national magazines—Mrs. Wayne introduces the lay reader to some of the outstanding men who photograph the productions seen in the world's film theatres, and pays high tribute to the artistry, technical skill, and ingenuity of the masters of the camera. The material for the article was obtained through the co-operation of the officers of the American Society of Cinematographers, and marks an important milestone in the Society's first efforts to gain more widespread recognition of the camera profession. Readers of the American Cinematographer are advised to read Mrs. Wayne's current article.

Ribbon Microphones Work Best in the Tropics

(Continued from Page 135)

cans again in the same manner in which Eastman had originally sealed them for us. The film was shipped back to the United States for development.

For test strips we had taken a Leica developing tank with us. This permitted us to make our test developments right on location. Although there was a small laboratory in Singapore, we found that by making our own test developments we could facilitate production greatly.

The light conditions of the tropics are not ideal. Super-sensitive film, in my opinion, is the only stock to use. The normal light is very yellow. It is natural that the background of much production made there will be in the jungles. The deep shadows demand a fast film.

I found the gelatine filter which is sealed between two pieces of photographic glass with balsam the most successful. Other types sprung and fogged on me, and the pure gelatine, of course, crumbles. The sealed gelatine filter . . . if properly sealed on the edges is ideal. In other words, it all comes down to the point of how securely the two pieces of glass are sealed together to keep out the moisture

In addition to making the jungle picture we also took scenes for another production which will include the festivities which were in progress when we reached Singapore in honor of the Sultan.

For the first time in history, our company was permitted to photograph scenes on the inside of the palace and to also photograph all of the dignitaries.

For this occasion I had to wear the regular court costume for photographing. I was given a slight concession, however, and was permitted to wear the white dinner coat at 7 o'clock in the morning instead of the regular black dress clothes which are demanded on an occasion of this kind.

The Sultan, or as he is known, Susu Honan of Solo, at Socrakara, Java, Dutch East Indies, has a complete sound theatre in his palace where all of the latest pictures are put on for his entertainment.

The courtesies extended me in this country were unusual in spite of the fact that imposters have entered Java representing themselves as being with responsible organizations in the United States, only to prove later that they not only misrepresented themselves, but abused the courtesies given them. My American Society of Cinematographers membership card gave me entree to many places I could not otherwise have entered.

Fear On Fishing Trip

Captain Fear of the Fearless Camera Company, is spending several weeks vacation up in the Canadian Rockies there he is endeavoring to hook the elusive trout.

Al Gilks Shoots Annapolis

Al Gilks, A.S.C., has just returned from a trip to Annapolis, where he acted as first cameraman on a series of scenes which were shot in that locale for a forthcoming release.

B & H Special Semi-Professional 70D 16mm. Camera

(Continued from Page 143)

as long as one desires, up to the full capacity of the film magazine.

Two extremely practical features characterize this motor installation. First: The original model 70 camera is not altered in any manner, but by the addition of the magazine pulley and hand crank device, and therefore can be used with or without the attachment.

The spring motor is intact and if the camera is to be used as a light hand portable camera, it is merely necessary to detach the motor, detach the magazine and cover the opening in the back of the camera with a special plate, which is supplied.

The camera, thus stripped of the new accessories, has all the features and characteristics of the well-known FILMO 70 and is operated through its spring motor.

With or without magazines, operated either by spring-motor, hand crank or electric motor, the camera can be operated at all the speeds for which it is designed, according to its model, whether 70-A, 70-D, or 70-E. This feature is made possible by the fact that the operating speed of the camera is controlled by its governor.

The hand crank device serves also the the most useful purpose of permitting the rewinding of the film for making lap-dissolves, double exposure, or whatever effect that is desired where the film has to be exposed twice in succession.

When rewinding the film, the action of the crank also winds the spring-motor and therefore the length of film that can be rewound is limited only to the capacity of the spring motor; that is to say, 27 feet, if the spring was completely unwound when the rewinding is started, or whatever is the length of film corresponding to number of crank necessary to completely wind the spring.

Magazine and motor installation do not interfere in any manner whatsoever with the installation and use of the latest addition to the camera so that the critical focuser, the alignment gauge, the customary filters, the iris vignetter, etc., are as, and even more, efficient than heretofore.

Another extremely useful attachment

which can be used independently for the others above mentioned is a range finder made as an integral part of the camera part.

By depressing a lever, a split prism is set in front of the eye-piece and the image of the object is seen simultaneously through two windows at the top and bottom, respectively, of the range finder.

When looking through the eye-piece the center of the image will show a displacement when the finder's dial is rotated; but by rotating the dial in one or the other direction, a point will be reached when the central portion of the image will exactly coincide with its constantly stationary portion. The correct distance from object to camera is then read through the dial. The range finder is calibrated to read 2, 2½, 3, 3½, 4, 5, 6, 7, 8, 10, 12, 15, 20, 30, 50, 100 feet and infinity within a maximum possible error of ¼-inch, at a distance of three feet, which is obviously negligible.

The above necessarily briefly described attachments and accessories bring the FILMO camera to such a standard of versatility that it can be classed as a semi-professional apparatus, and it is anticipated that its usefulness will be proven by screen results of par excellence.

Hollywood Laboratories Forming Code

● A dozen or more of the laboratory men of Hollywood have had a series of meetings to form a Code for presentation to the government. While a similar organization is working along the same lines in New York City, it was evident that those engaged in this work in Hollywood operate under entirely different conditions than any other part of the country. The majority of the independent Hollywood Laboratories specialize on effects and trick stuff while those in other sections devote most of their time to release prints or general laboratory operations.

The Hollywood laboratories in this group represent a working staff of between 100 and 150 people. The group has been organized under the name of the Cinema Laboratories Association, with H. K. Batchelder acting as secretary.

The Code as called for under the law will attempt to establish not only prices to be put into force, but also the other conditions which the Code demands they place in regulation.

Mitchell Increases Force

●During the past week, the working force in the Mitchell Camera Company plant has been considerably augmented. Increased orders for Mitchell equipment and improvements in experimental stages has demanded this.

Photography of the Month

(Continued from Page 136)

and allowed insufficient time to make adequate preparation for the rather intricate maneuvre.

"MAMA LOVES PAPA"
Paramount Production
photographed by
Gilbert Warrenton, A.S.C.

Broad comedy is never the sort of thing which permits the cinematographer to show his wares to the best advantage; and although Cinematographer Warrenton has photographed his players to good advantage, made some very nice exteriors, and done his duty like a cinematographer and a gentleman, "Mama Loves Papa" is by no means rerpesentative of his best work. It is entertaining, however, well directed, photographed, and played. It is well worth seeing.

"BEST OF ENEMIES"
Fox Production
photographed by
Lewis William O'Connell, A.S.C.

Despite story and director-trouble, this production) originally "Five Cents a Glass") emerges as a delightfully innocuous little musical with a surprising resemblance to some of the UFA musicfilms. Between Cinematographer O'Connell's camera and Art Director Darling's sets, the film captures much of the delightful atmospheric value of the German musical-comedies which have captivated so many audiences. The atmosphere (despite somewhat burlesqued performances by Frank Morgan and Joseph Cawthorne) is believable; and especially so in the parts of the film laid in Germany. "Bill" O'Connell is to be congratulated on his fine work, and upon his departure from hackneyed methods of lighting and composition.

"DOUBLE HARNESS"
RKO Production
photographed by **J. Roy Hunt**
Special Effects by **Vernon Walker, A.S.C.**

Dramatically, this film is of roadshow calibre: far and away the best thing Ann Harding has done in years; photographically, the laurels are all with the process staff. Bill Powell is very badly photographed, and there are several sequences in which the diffusion is badly abused, with no attempt at diffusion-continuity. The process photography, however, by Vernon Walker, A.S.C., is excellent, and adds immeasurably to the authenticity of the atmosphere.

"STRANGER'S RETURN"
Metro-Goldwyn-Mayer Production
Photographed by
photographed by **William Daniels, A.S.C.**

There is only one thing anyone can say about a production bearing the name of William Daniels, A.S.C., as photographer: that it is photographically excellent. "Stranger's Return" is no exception to this rule; it is in every way up to Daniels' usual fine standard. Moreover, it gives him an interesting opportunity to prove that he is quite as capable at photographing beautiful exterior scenes as at handling superb interiors. It may be argued—with good cause—that he indulges in a bit too much diffusion throughout; on the other hand, it must be remembered that the story is essentially a sentimental one, to which ample diffusion is well suited. Moreover, Daniels has preserved an excellent continuity of diffusion, so that even though he has indulged in a considerable degree of softness, the result is pleasing and consistent. The only major flaw (here speaks the ex-middle-westerner!) is Lionel Barrymore's beard. Despite Daniels' tasteful photography, King Vidor's excellent direction, and Barrymore's intrinsically fine performance, you can't enjoy them with those darn whiskers waving gracefully in the breeze!

Dean Opens Camera Supply Business

●Faxon Dean, one of Hollywood's cameramen of long standing, launched his new enterprise this last month in the opening of the Camera Supply Co., Ltd., at 1515 Cahuenga Blvd., Hollywood.

Dean is equipping his establishment to serve the needs of both the amateur and professional camera man.

DIRECTORY of DEALERS

Handling the American Cinematographer

ARIZONA

Phoenix: Studio of Sound, P. O. Box 1671.
Tucson: William M. Dennis, 22 United Bank Bldg.
Nogales: A. W. Lohn, 309 Morley Ave.

ARKANSAS

Judsonia: Lee's Novelty House.

CALIFORNIA

Berkeley: Berkeley Commercial Photo Co., 2515 Bancroft Way.
Beverly Hills: Bob Robinson Home Movies, 417 N. Beverly Drive.
Fresno: Potter Drug Co., 1112 Fulton Ave.
Glendale: Kug Art Photo Service, 205 So. Brand Blvd.
Hollywood: Bell & Howell Co., 716 North La-Brea Ave.
Educational Projecto Film Co., 1611 North Cahuenga Blvd.
Hollywood Camera Exchange, Ltd., 1600 N. Cahuenga Blvd.
Hollywood Citizen, 6366 Hollywood Blvd.
Hollywood Movie Supply Co., 6038 Sunset Blvd.
J. V. Merchant, 6331 Hollywood Blvd.
Morgan Camera Shop, 6305 Sunset Blvd.
Universal News Agency, 1655 Las Palmas.
Los Angeles: California Camera Hospital, 321 O. T. Johnson Bldg.
Eastman Kodak Stores, Inc., 643 So. Hill Street.
T. Iwata Art Store, 256 East First St.
Lehnkering Pharmacy, 1501 N. Western Ave.
B. B. Nichols, 731 South Hope St.
Tappenbeck & Culver, 10958 Weyburn Ave., Westwood Village.
Victor Animatograph Corp., 650 So. Grand Ave.
Wilshire Personal Movies, 3150 Wilshire Blvd.
Monrovia: Cliff's Photo Art Shop.
North Hollywood: Studio City Pharmacy, 12051 Ventura Blvd.
Oakland: Adams & Co., 380 14th St.
Eastman Kodak Stores, Inc., 1918 Broadway.
Pasadena: The Flag Studio, 59 East Colorado St.
Richard Fromme, 965 S. Fair Oaks.
A. C. Vroman, 329 East Colorado St.
Richmond: La Moine Drug Co., 900 Macdonald Ave.
Sacramento: Frank McDougal, 1017 10th St.
San Bernardino: Steele's Photo Service, 370 D Street.
San Diego: Harold E. Lutes, 958 Fifth St.
Ace Drug Co., 820 W. Washington St.
Eastman Kodak Stores, Inc., 419 Broadway.
San Francisco: Eastman Kodak Stores, Inc., 216 Post St.
Hirsch & Kaye, 239 Grant Ave.
San Francisco Camera Exchange, 88 Third St.
Schwabacher-Frey Stationery Co., 735 Market St.
Sherman, Clay & Co., Kearny & Sutter Sts.
Trainer-Parsons Optical Co., 228 Post Street.
San Jose: Webb's Photo Supply Store, 66 So. First St.
San Rafael: Webb & Rogers, 4th & B Sts.
Santa Barbara: J. Walter Collinge, 1127 State St.
The Camera Shop, 800 State St.
Faulding's, 623 State St.
Stockton: The Holden Drug Co., Weber Ave. & Sutter St.
Logan Studios, 20 N. San Joaquin St.

COLORADO

Denver: Eastman Kodak Stores, Inc., 626 Sixteenth St.
The May Co., 16th & Champa Sts.

CONNECTICUT

Bridgeport: Harvey & Lewis Co., 1148 Main St.
Danbury: Heim's Music Store, Inc., 221 Main Street.
Hartford: The D. G. Stoughton Co., 1255 S. Whitney St.
Watkins Bros., 241 Asylum St.
Meriden: Broderick & Curtin, 42 E. Main St.
Middletown: F. B. Fountain Co., 483 Main St.
New Haven: Eugene F. Clark Book Shop, 343 Elm St.
Norwich: Cranston Co., 25 Broadway.
Waterbury: Curtis Art Co., 65 W. Main St.

DELAWARE

New Castle: E. Challenger & Son.
Wilmington: Butler's, Inc., 415 Market St.
Wilmington Elec. Spec. Co., Inc., 405 Delaware Ave.

DISTRICT OF COLUMBIA

Washington: Columbia Photo Supply Co., Inc., 1424 New York Ave., N. W.
Eastman Kodak Stores, Inc., 607 14th St., N. W.
Robbins, National Press Bldg., 529 14th St., N. W.

FLORIDA

Clearwater: Courtesy Cigar Store, Post Office Arcade.
Jacksonville: Eastman Kodak Stores, Inc., 129 W. Adams St.
Miami: Miami Photo Supply Co., 31 S. E. First Ave.
St. Petersburg: Robinson's Camera Shop, 410 Central Ave.
Tampa: Burgert Bros., Inc., 608 Madison St.

GEORGIA

Atlanta: Eastman Kodak Stores, Inc., 183 Peachtree St.

IDAHO

Boise: Ballou-Latimer Co., 9th & Idaho.

ILLINOIS

Bloomington: Hawkins Studio, 214 W. Washington.
Chicago: Almer, Coe & Co., 105 N. Wabash Ave.
Associated Film Libraries, Inc., Suite 224, 190 N. State St.
Bass Camera Co., 179 West Madison St.
Central Camera Co., 230 S. Wabash Ave.
Eastman Kodak Stores, Inc., 133 N. Wabash Ave.
Fair, The, Camera Dept., 7th Floor, State-Adams-Dearborn Sts.
Lake Shore Radio Co., 3204-6 Broadway.
Lyon & Healy, Inc., Wabash Ave. at Jackson Blvd.
Stanley Warren Co., 918 Irving Park Blvd.
Norman Willets Co., 318 W. Washington St.
Wolk Camera Co., 201 S. Dearborn St.
Evanston: Almer, Coe & Co., 1645 Orrington Ave.
Hattstrom & Sanders, Inc., 702 Church St.
Galesburg: Illinois Camera Shop, 84 So. Prairie St.
Moline: Sealoholms Kodak Co., 1507 Fifth Ave.
Rockford: Johnson Photo Shop, 316 E. State St.
Springfield: Camera Shop, The, 320 S. Fifth St.

INDIANA

Evansville: Smith & Butterfield, 310 Main St.
Fort Wayne: The Howard Co., Inc., 112 W. Wayne St.
Indianapolis: L. S. Ayers & Co., Dept. 290, 1 West Washington St.
South Bend: Ault Camera Shop, 122 S. Main St.
Terre Haute: Snyder's Art Store, 21 S. 7th St.

IOWA

Cedar Rapids: Camera Shop, 220 Third Ave.
Davenport: Eastman Kodak Stores, Inc., 318 Brady St.
Des Moines: Eastman Kodak Stores, Inc., 808 Locust St.
Iowa City: Rexall & Kodak Store, 124 E. College St.
Sioux City: Lynn's Photo Finishing, Inc., 419 Pierce St.
Eastman Kodak Stores, Inc., 608 Pierce St.
Waterloo: Mack's Photo Shop.

KANSAS

Topeka: Hall Stationery Co., 623 Kansas Ave.
Wichita: Jack Lewis Film Service, 329 Sedgwick Building.
Lawrence Photo Supply, 149 N. Lawrence Ave.

KENTUCKY

Lexington: W. W. Still, 129 W. Short St.
Louisville: A. L. Bollinger Drug Co., Stilz & Frankfort Ave.
Sutcliffe Co., 225 S. 4th Ave.

LOUISIANA

Alexandria: The Newcomb Studios, 324 Johnston.
Monroe: Griffin Studios, P. O. Box 681.
New Orleans: Eastman Kodak Stores, Inc., 213 Baronne St.

MAINE

Auburn: Wells Sporting Goods Co., 52-54 Court St.
Portland: Bicknell Photo Service, 43 Exchange St.

MARYLAND

Baltimore: Eastman Kodak Stores, Inc., 309 N. Charles St.
Stark-Films, 219 W. Centre St.
Zepp Photo Supply Co., 3044 Greenmount Ave.
Hagerstown: R. M. Hays & Bros., 2830 W. Washington St.

MASSACHUSETTS

Boston: Eastman Kodak Stores, Inc., 38 Bromfield St.
Boston Camera Exchange, 44 Bromfield St.
Cinecraft Co., of New England, 80 Boylston St.
Ralph Harris Co., 30 Bromfield St.
Iver Johnson Sporting Goods Co., 155 Washington St.
Andrew J. Lloyd Co., 300 Washington St.
Pathescope Co. of the N. E., Inc., 438 Stuart St.
Pinkham & Smith Co., 15 Bromfield St.
Stillfilm Sales Co., 40 Stuart St.
Braintree: Alves Photo Shop, 349 Washington St.
Cambridge: E. M. F. Electrical Supply Co., 430 Massachusetts Ave.
Lowell: Donaldson's, 75 Merrimack St.
Lynn: Moehring's, Inc., 490 Washington St.
New Bedford: J. Arnold Wright, 7 S. Sixth St.
Newtonville: Newton Photo Shop, 92 Bower St.
Pittsfield: E. C. Kilian, 411 North St.
Salem: Pitman Movie Service, 45 Summit Ave.
Springfield: Harvey & Lewis Co., 1503 Main St.
J. E. Cheney & Co., Inc., 301 Bridge St.
Worcester: Harvey & Lewis Co., 513 Main St.

MICHIGAN

Detroit: Crowley, Milner & Co.
Clark Cine-Service, Rooms 203-204 Professional Bldg., 10 Peterboro.
Detroit Camera Shop, 424 Grand River W.
Eastman Kodak Stores, Inc., 1235 Washington Blvd.
H. C. Film Service, 12191 Ilene Ave.
J. L. Hudson Co., Dept. 290.
E. B. Meyrowitz, Inc., 1516 Washington Blvd.
Flint: Gardner Photo Service.
Grand Rapids: Camera Shop Stores, Inc., 56 Monroe Ave.
Photo Service Shop, 44 Monroe Ave.
Jackson: Royal Film Service, 125 Michigan Ave. W.

Lansing: Linn Camera Shop, 109 S. Washington Ave.
Saginaw: Heavenrich Bros. & Co., 301 Genesee.

MINNESOTA

Duluth: Eastman Kodak Stores, Inc., 3 W. Superior St.
LeRoy: Ivan E. Meyers, Home Movie Service, 215 W. Main St.
Minneapolis: Eastman Kodak Stores, 112-116 So. Fifth St.
Gospeter's Blue Front, 1006 Nicollet Ave.
National Camera Exchange, 5 South Fifth St.
Owatonna: B. W. Johnson Gift Shop, 130 W. Bridge St.
St. Paul: Eastman Kodak Stores, Inc., Kodak Bldg., 91 E. Sixth St.
H. W. Fisher Photographic Supplies, 381 Minnesota St.

MISSOURI

Kansas City: Eastman Kodak Stores, Inc., 916 Grand Ave.
Eastman Kodak Stores, Inc., 1006 Main St.
Hanley's Photo Shop, 116 E. 10th St.
Plaza Camera Co., 218 Alameda Rd.
St. Louis: Eastman Kodak Stores, Inc., 1009 Olive St.
Famous-Barr Co., M. P. Dept. 6th & Olive St.
Geo. D. Fisher & Co., 915 Locust St.

MONTANA

Billings: Midland Drug Co., 23 N. 27th St.
Bozeman: Alexander Art Co.

NEBRASKA

Lincoln: Eastman Kodak Stores, Inc., 1217 O St.
Eastman Kodak Stores, Inc., 419 S. 16th St.
Omaha: J. C. Kretschmer & Co., 1617 Harney St.

NEW HAMPSHIRE

Lebanon: Photocraft Co.
Newport: K. E. Waldron, 1 A Main St.

NEW JERSEY

Atlantic City: Eastman Kodak Stores, Inc., 1735 Boardwalk.
Bayonne: Milton Mendelwager, 192 Ave. B.
Cliffside Park: Louis C. Chiosay, 639 Anderson Ave.
East Orange: Edmund J. Farlie Jr., 45 N. 19th St.
Hawthorne: Hawthorne Home Movie Service, 52 MacFarlan Ave.
Irvington: Wolf Bros., 1340 Springfield Ave.
Jersey City, Levy's Sport Shop, 149 Monticello Ave.
Montclair: Edward Madison Co., 42 Bloomfield Ave.
Newark: Anspach Bros., 838 Broad St.
Paterson: Robt. G. Smith, 40 Hamilton St.
Sykes Drug Store, 179 Market St.
Summit: Eastman Bookshop, 380 Springfield Ave.
Trenton: Howard E. Thompson, 35 Newkirk Ave.
Union City: Heraco Exchange, Inc., 611 Bergenline Ave.
West New York: Rembrandt Studios, Inc., 526A Bergenline Ave.

NEW MEXICO

Santa Fe: Capital Pharmacy, Inc.

NEW YORK

Albany: Albany Photo Supply Co., Inc., 204 Washington Ave.
Binghamton: A. S. Bump Co., Inc., 180 Washington St.
Brooklyn: Geo. J. McFadden, Inc., 202 Flatbush Ave.
Abraham & Straus, Inc., Fulton & Hoyt Sts.
J. Navilio, 1757 Broadway.
Buffalo: Buffalo Photo Material Co., 37 Niagara St.
Hauser Bob Studio, 11 West Tupper St.
J. F. Adams, Inc., 459 Washington St.
Nowak Optical Co.
United Projector & Film Corp., 228 Franklin St.
Goshen: T. H. Finan.
Haverstraw: E. H. Vandenburgh, 3 Broadway.
Hempstead: Agnew's, 47 Main St.
Islip, H. L. Terry & Sons.
Ithaca: Henry R. Head, 109 N. Aurora St.
Long Island City: Leonard F. Kleinfield, 4202 Queen's Blvd.
New Rochelle: Artist's Photo Service, 219 Hugenot St.
New York City: Wm. C. Cullen, 12 Maiden Lane.
Adam Archinal Corp., 305 W. 56th St.
Ambercrombie & Fitch, 45th & Madison Ave.
Bloomingdale's, 59th & Lexington Ave.
J. H. Boozer, 145 E. 60th St.
Columbus Photo Supply Co., 146 Columbus Ave.
Abe Cohen's Exchange, 120 Fulton St.
Davega, Inc., 111 East 42nd St.
Davega, Inc., Empire State Building.
Eastman Kodak Stores, Inc., 356 Madison Ave. at 45th St.
Fotoshop, Inc., 136 W. 32nd St.
H. & D. Folsom Arms Co., 314 Broadway.
Gall & Lembke, Inc., 7 East 48th St.
Gillette Camera Stores, Inc., 117 Park Ave.
Gimbel Bros., Dept. 575, 33rd St. & Broadway.
Joseph P. Hackel, 1919 Chanin Bldg., 122 E. 42nd St.
Harry's Camera Exchange, 317 W. 50th St.
Hecker's Camera Store, 1519 Amsterdam Ave.
Herbert & Huesgen Co., 18 E. 42nd St.
Lugene, Inc., 600 Madison Ave., between 57th & 58th.
Luma Camera Service, Inc., 302 W. 34th St.
Mogull Bros. Electric Corp'n., 1944 Boston Road, Bronx.
Newman's Camera Shop, 1197 Sixth Ave.
New York Camera Exchange, 109 Fulton St.
Pago, Inc., 1095 Sixth Ave.
Pickup & Brown, 368 Lexington Ave.
Rab Sons, 1373 Sixth Ave.
Schoenig & Co., Inc., 8 East 42nd St.
Sibley, Lindsay & Curr Co.
Frank Tanham & Co., Inc., 9 Church St.
Times Building News Stand, Inc., Times Building.
Willoughby's, 110-112-114 West 32nd St.
Richmond Hill: Josephson Bros., 10902 Jamaica Ave.
Rochester: Marks & Fuller, Inc., 36 East Ave.
Smith, Surrey, Inc., 129 Clinton Ave., South.
Rome: Fitchard Studio, 133-135 W. Liberty St.
Schenectady: J. T. & D. B. Lyon, 236 State St.
Syracuse: Geo. F. Lindemer, 443 S. Salina St.
Francis Hendricks Co., Inc., 339 So. Warren
Troy: A. M. Knowlson & Co., 350 Broadway. St.
Utica: Edwin A. Hahn, 223-225 Columbia St.
Yonkers: W. J. Dolega, 242 Nepperham Ave.

NORTH CAROLINA

Charlotte: W. I. Van Ness & Co., 213 N. Tryon St.

OHIO

Akron: Pockrandt Photo Supply Co., 16 N. Howard St.
Canton: Ralph Young News Agency.
The Camera Shop, 531 Market Ave. N.
Cincinnati: Eastman Kodak Stores, Inc., 27 West Fourth St.
Huber Art Co., 124 Seventh St., W.
John L. Huber Camera Shop, 416½ Main St.
L. M. Prince Co., 108 W. Fourth St.
Cleveland: The Home Movies, Inc., 2025 Euclid Ave.
Dodd Co., 652 Huron Road.
Eastman Kodak Stores, Inc., 806 Huron Road, 1862 E. 6th St., 1915 E. 9th St., Union Trust Bldg.
Escar Motion Picture ervice, Inc., 10008 Carnegie Ave.
Halle Bros. Co., 1228 Euclid Ave.
Higbee Co., 90 Public Square.
Columbus: Capitol Camera Co., 7 E. Gay St.
Columbus Photo Supply, 62 E. Gay St.
Home Movies Co., 234 S. High St.
Don McAllister Camera Co., 73 E. State St.
Dayton: Dayton Camera Shop, 1 Third St., Arcade.
Middletown: Lee R. Chamberlain, care Roy A. White's Elec. Shop, 48 S. Broad St.
Portsmouth: V. E. Fowler, 824 Galia St.
Salem: Butcher's Studio, 166 South Broadway.
Steubenville: Beall & Steele Drug Co., 424 Market St.
Toedo: Gross Photo Supply Co., 325 Superior St.
Franklin Print & Eng. Co., 226-36 Huron St.
Youngstown: Eastman Kodak Stores, Inc., 7 Wick Ave.
A. C. Saunders, 177 Benita Ave.
Zanesville: Zulandt's Drug Store, Widney, cor. Seventh & Main.

OKLAHOMA

Oklahoma City: H. O. Davis, 522 N. Broadway.
Tulsa: Camera Shoppe, Inc., and the Charles High Productions, 1213 S. Boulder Ave.

OREGON

Lakeview: Getty's Photo Studio, I.O.O.F. Bldg., Center & Main Sts.
Marshfield: Mel's News Stand, cor. Broadway & Anderson.
Pendleton: J. T. Snelson, 608 Gardner St.
Portland: Eastman Kodak Stores, Inc., 345 Washington St.
Lipman-Wolfe & Co., Kodak Dept., Fifth, Washington & Alder Sts.
Meier & Frank Co., Kodak Dept., Fifth, Sixth, Morrison & Alder Sts.

PENNSYLVANIA

Allentown: M. S. Young & Co., 736-40 Hamilton St.
Easton: Easton Sporting Goods Co., 2nd and Northampton St.
Erie: Kelly Studios, 1026-28 Peach St.
Harrisburg: James Lett Co., 225 N. 2nd St.
Johnstown: Johnstown News Co., 115 Market St.
Lancaster: Pugh's Art Shoppe, 33 W. King St.
Langhorne: National Entertainment Service, 360 Bellevue Ave.
Lebanon: Harpel's, 757-9 Cumberland St.
Philadelphia: Klein & Goodman, 18 South Tenth St.
Camera Shop, 51 N. 52nd St.
G. P. Darrow Co., Inc., 5623-5 Germantown Ave.
Eastman Kodak Stores, Inc., 1020 Chestnut St.
Home Movies Studio, 20th & Chestnut Sts.
MacCallum Stores, 1600 Sansom St.
M. & H. Sporting Goods Co., 512 Market St.
Newsreel Laboratory, 1707 Sansom St.
Strawbridge & Clothier, Dept. 201, Market, Eighth & Filbert Sts.
George W. Tegan, 420 E. Mt. Airy Ave.
John Wanamaker's Motion Picture Dept., No. 1 Broad St.
Williams, Brown & Earle, Inc., 918 Chestnut St.
Pittsburgh: Eastman Kodak Stores, Inc., 606 Wood St.
B. K. Elliott & Co., 126 - 6th St.
Joseph Horne Co., Magazine Dept.
Kaufmann Dept. Store, Inc., Dept. 62, Fifth Ave.
Reading: W. F. Drehs, 541 Court St.
Scranton: Houser's, 133 N. Main Ave.
Wallace & Cook, Inc., 2-5 N. Washington Ave.
Scranton Home Movies Library, 316 N. Washington Ave.
Shamokin: Jones Hardware Co., 115 E. Independence St.
Wilkes Barre: Ralph DeWitt, 2 South River St.
Windber: New Arts Feature, 508 - 15th St.
York: Sweigart's Photo Service Shop, 278 W. Market St.

RHODE ISLAND

Pawtucket: Thomas N. Simpson, Broadway & Exchange St.
Providence: E. P. Anthony, Inc., 178 Angell St.
Starkweather & Williams, Inc., 47 Exchange Pl.
Westcott, Slade & Balcom Co., 95-99 Empire St.

TENNESSEE

Jackson: Southern Pictures Corp.
Knoxville: Jim Thompson Co., 415 W. Church St.
Memphis: Memphis Photo Supply Co., 122 Union Ave.
Nashville: Geo. C. Dury Co., 420 Union St.

TEXAS

Abilene: W. C. Cosby, 249 Pine St.
Dallas: Jamieson Film Laboratories, 2212 Live Oak St.
E. G. Marlow Co., 1610 Main St.
Fort Worth: The Camera Shop, Inc., 113 W. Sixth St.
Chas. G. Lord Optical Co., 704 Main St.
Houston: Star Elec. & Eng. Co., Inc., 613 Fannin St.
San Antonio: Fox Co., 209 Alamo Plaza.

UTAH

Salt Lake City: Eastman Kodak Stores, Inc. 315 S. Main St.

VIRGINIA

Norfolk: G. L. Hall Optical Co., 257 Granby St
Richmond: G. L. Hall Optical Co., 418 E. Grace St.

VERMONT

Burlington: G. W. La Pierre's, 71 Church St.

WASHINGTON

Bellingham: Clyde Banks, 119 W. Holly St.

Continued on Page 122

Infra-Red Now Developed For Use of Professionals and Amateurs

"Recent improvements in infra-red-sensitive plates, both in speed and in the character of their infra-red sensitivity, make them more practical for the use of photographers who wish to take advantage of the special results and the unusual effects they offer. This information is contained in a current announcement by the Eastman Kodak Company.

"Photography at considerable distances is perhaps the widest present possible use of infra-red-sensitive materials. They may also be used for fantastic night effects by daylight, or to produce a near-by landscape of unusual character. The blue sky photographs black, while green foliage, which is a very strong reflector of infra-red, photographs a silvery white.

"Photographs 'in total darkness' are another trick possible with these plates. Deciphering of obscure documents is a practical use.

"For several years the Kodak Research Laboratories have supplied plates for infra-red photography under the names 'Eastman Extreme-red Sensitive' and 'Eastman Infra-red Sensitive.' Recent advances in the preparation of sensitizing dyes have made it possible to manufacture improved plates, and these plates are now standardized under the following designations:

" 'Eastman Infra-red Sensitive Plates, Type I-R,'

" 'Eastman Infra-red Sensitive Plates, Type I-P,'

" 'Eastman Infra-red Sensitive Plates, Type I-K.'

"The Type I-R plates are recommended for general infra-red photography, including landscape work, documentary photography, etc., and for the infra-red photography of non-luminous hot bodies, such as flatirons and furnaces. These plates permit the shortest possible exposures to be given.

"The Type I-P plates are a somewhat faster variety of the plates previously sold as 'Eastman Infra-red Sensitive.' They are suitable for 'photography in total darkness' (with a Wratten Filter Number 87 covering powerful tungsten lamps).

"The Type I-K plates are those previously supplied as 'Eastman Extreme-red Sensitive.' For most purposes, the new Type I-R plates will take their place.

"For infra-red photography with these plates, the Wratten A (Number 25) Filter may be used on the lens of the camera. Other red filters (Number 70, Number 89A, etc.) are equally effective but offer no advantages. The Number 87 filter, which transmits no visible light, must be used, over the light source, for 'photography in total darkness'; but it

(Continued on Next Page)

Pullman: Graves Studio.
Seattle: Anderson Supply Co., 111 Cherry St.
Eastman Kodak Stores, Inc., 1415 - 4th Ave.
Lowman & Hanford Co., 1514 - 3rd Ave.
Spokane: John W. Graham & Co., Dept. C, 707 Sprague Ave.
Joyner Drug Co., Howard & Riverside Ave.
Tacoma: Eastman Kodak Stores, Inc., 910 Broadway.
Walla Walla: Book Nook Drug & Stationery Store.

WEST VIRGINIA
Wheeling: Twelfth St. Garage, 81 - 12th St.

WISCONSIN
Fond du Lac: Huber Bros., 36 S. Main St.
La Crosse: Moen Photo Service, 313 Main St.
Madison: Photoart House, 212 State St.
Milwaukee: Eastman Kodak Stores, Inc., 737 N. Milwaukee St.
Boston Store, Wisconsin Ave. & 4th St.
W. E. Brown, 327 W. National Ave.
Gimbel Bros., E. Wisconsin & N. Plankington.
Roa Meuer, The, 226 West Wells St.
Phillips: Jakoubek's', 132 N. Lake Ave.
Racine: Photo-Crafts Shop, 526 College Ave.

AUSTRALIA
Melbourne: McGills Agency, 179-218 Elizabeth St.

CHINA
Canton: International Book Co., 269 North Wing Hon Road.

ENGLAND
London: J. H. Dallmeyer, Ltd., 31 Mortimer St. and Oxford St. W. 1.

HAWAII
Honolulu: Eastman Kodak Stores, 1059 Fort St.

INDIA
Bombay: Continental Photo Stores, 255 Hornby Road.
P. C. Eranee Sons, Albert Bldgs., Hornby Road.
Calcutta: Photographic Stores & Agency Co., 154 Dhuramtolla St.
M. L. Shaw, 5/1 Dhuramtolla St.
Lucknow: Lucknow Commercial Co., 25 Aminabad Park.

MEXICO
American Photo Supply Co. S.A., Av. F.1, Madero, 43, Mexico, D.F.

POLAND
Warsaw: Polska Agencia Prasy Filmowej Wspolna 35.

SOUTH AMERICA
Buenos Aires: Argentine Rep., Casa America Ltda. S. A. Avenda de Mavo 959.

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can be used only with Type I-P plates.

"In infra-red photography it is important to avoid the use of hard-rubber slides in plate holders, the Kodak Company's announcement warned. Such slides are translucent to infra-red rays unless the rubber contains sufficient composition to make them opaque. Fiber-board slides and metal slides are safe in this respect."

Lloyd Knechtel Joining London Laboratory

● As this goes to press, Lloyd Knechtel, for four years head of the Special Photographic Effects Department at the RKO Hollywood studio, and one of the industry's foremost authorities on Optical Printing and other process work, is leaving for London. In England he will be affiliated with Randal Perraneu, holder of the British rights to the well-known Dunning Process, and one of the partners of the George Humphries laboratory in London. The new organiaztion will pioneer in the field of photographic effects for the British and Continental studios, as well as serving American producers. The recognized need for such a service speaks well for the future of the new firm, and Knechtel's proven ability should carry them a long way.

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WANTED—Sept Camera must be reasonable. Address Box V150 American Cinematographer, 6331 Hollywood Blvd., Hollywood, Calif.

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WANTED—Mitchell High Speed Silent Camera, box only, without equipment. Must be cheap for cash. Box 140, American Cinematographer.

WANTED—"Leica" enlarger; must be in good condition and cheap. Box H.R., care American Cinematographer.

Wheels of Industry

(Continued from Page 138)

which permits a larger image to be seen. This feature is of great value especially to those who are required to wear glasses, as it permits them to see the field of view with the greatest of ease.

Another point of refinement is the inclusion of eyelets, one on each side, which are built into the camera body. These accommodate a special carrying strap equipped with snap-hooks, and permit the camera to be carried and used without the aid of a carrying case. The strap also serves to steady the camera when slow exposures are made with the camera held in the hands.

Fine Grain Film

● Kodak Panatomic Film, a panchromatic film of exceedingly fine grain, is currently making its debut for use with miniature cameras. The fine grain permits generous enlargements from diminutive negatives. Panatomic Film has the same speed as N.C. Film in daylight and is twice as fast by artificial light.

Panatomic Film is being manufactured in three types of rolls: F127, for cameras taking 16 pictures on the "vest pocket" roll; F117 for Kolleiflex cameras; and a 30-exposure daylight-loading roll for Leica cameras.

Filter factors for Panatomic Film are the same as for Kodak Supersensitive Panchromatic Film. As in the case of Super-Sensitive Panchromatic, a piece of black adhesive tape—supplied with each roll of film—must be used to cover the camera's red window except when the

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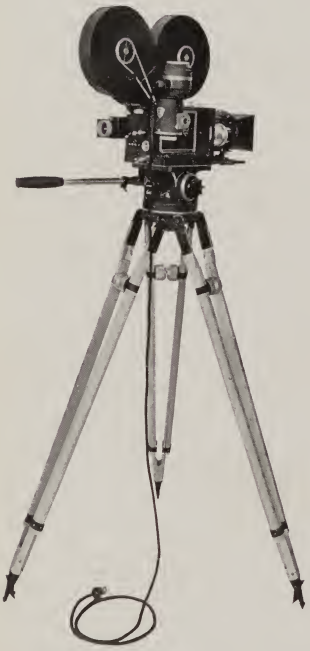

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